TEXTILES PAPER LEATHER

AMERICAN DYESTUFF REPORTER

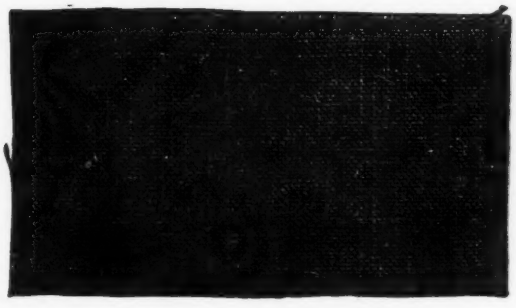
Including The Proceedings of the
AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

VOLUME XII APRIL 3, 1923 NUMBER 8

GEIGY COMPANY, Inc.

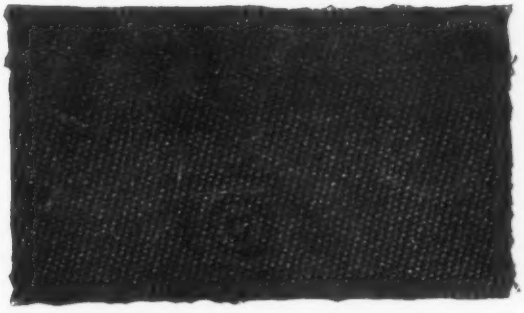
89-91 Barclay Street
New York City

ANILINE COLORS



POLYPHENYL BLUE G CONC.

is a very level dyeing direct color suitable for Cotton in all branches, and Union work.
Calendering does not change it.
Discharges clean with Hydrosulphite.



ACID MAGENTA 2B CONC.

This is to announce we are now in a position to supply this full, true type of Acid Magenta.

Sole Selling Agents for J. R. GEIGY S. A., Basle, Switzerland
Established 1764

Main Office J. R. Geigy S. A., Basle, Switzerland; in Great Britain
The Geigy Colour Co., Ltd., 35-37 Dickinson St., Manchester

BOSTON PROVIDENCE PHILADELPHIA TORONTO COLUMBUS, GA.

Headquarters of Raw Materials

for the

Textile Industry

DYESTUFFS AND COLORS OF ALL KINDS

Bichromate of Soda	Bichromate of Potash
Carbonate of Soda	Caustic Potash
Chloride of Lime	Caustic Soda
Formic Acid	French Talc
Acetic Acid	Glycerine
Gum Karaya	Verdigris

Olive Oil, Commercial

Imported Zinc Oxide

INQUIRIES SOLICITED

A·KLIPSTEIN & CO.

644-52 Greenwich St.

NEW YORK CITY

BRANCHES:

BOSTON PHILADELPHIA CHICAGO

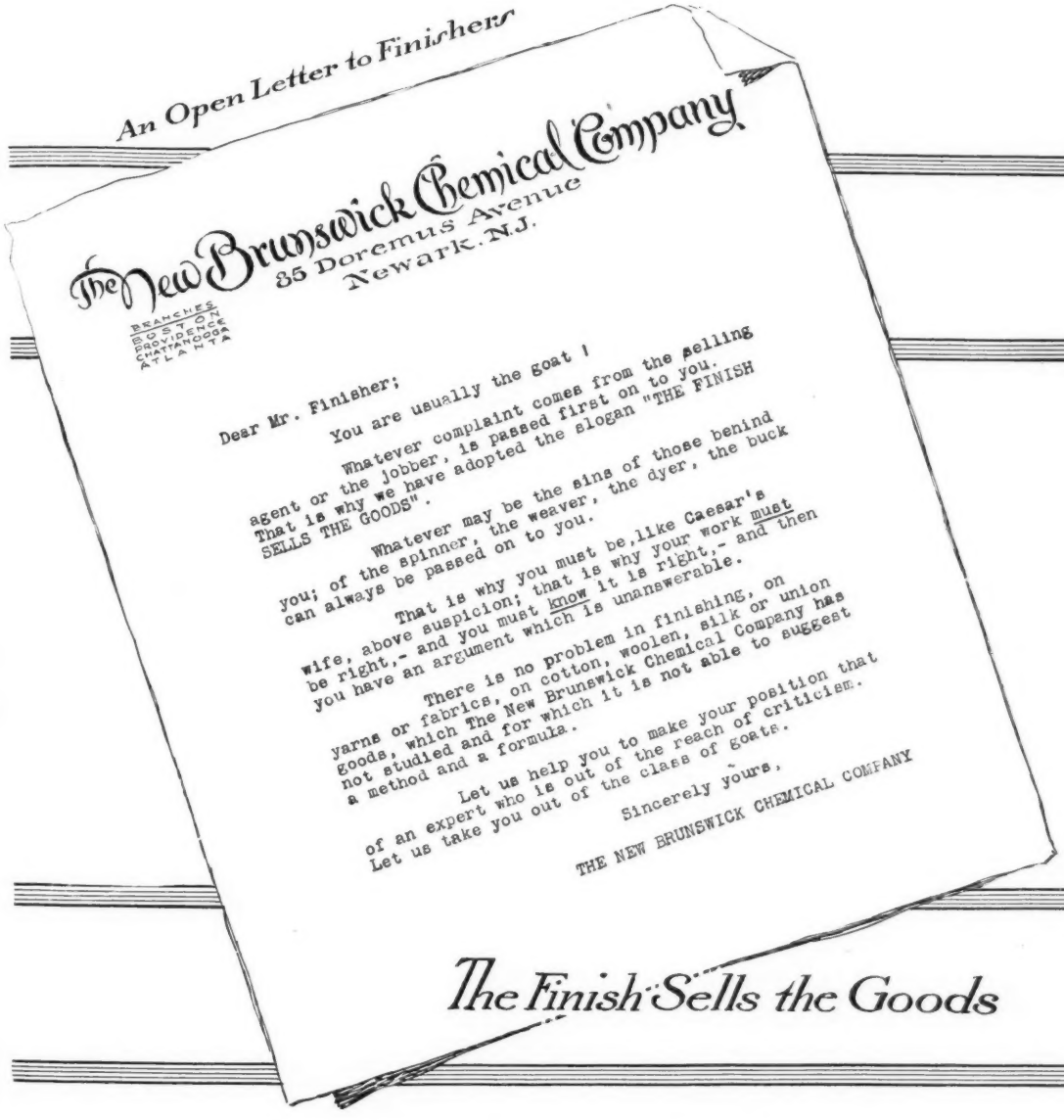
PROVIDENCE, R. I. CHARLOTTE, N. C.

Represented in Canada by

A. KLIPSTEIN & CO., LTD., 12 ST. PETER ST., MONTREAL

American Dyestuff Reporter, Vol. XII, No. 8. April 9, 1923. Published biweekly by Howes Publishing Co., Woolworth Building, New York, N. Y. Domestic subscription, $5.00; Canadian, $5.50; foreign, $6.00. Entered as second-class matter Nov. 6, 1919, at the New York, N. Y., Post-office, under the Act of March 3, 1879. Copyrighted, 1922, by Howes Publishing Co

"The Finisher is Usually the Goat"


An Open Letter to Finishers
The New Brunswick Chemical Company
85 Doremus Avenue
Newark, N.J.
BRANCHES
BOSTON
PROVIDENCE
CHATTANOOGA
ATLANTA
Dear Mr. Finisher;
You are usually the goat !
Whatever complaint comes from the selling agent or the jobber, is passed first on to you. That is why we have adopted the slogan "THE FINISH SELLS THE GOODS".
Whatever may be the sins of those behind you; of the spinner, the weaver, the dyer, the buck can always be passed on to you.
That is why you must be, like Caesar's wife, above suspicion; that is why your work must be right,- and you must know it is right,- and then you have an argument which is unanswerable.
There is no problem in finishing, on yarns or fabrics, on cotton, woolen, silk or union goods, which The New Brunswick Chemical Company has not studied and for which it is not able to suggest a method and a formula.
Let us help you to make your position that of an expert who is out of the reach of criticism. Let us take you out of the class of goats.
Sincerely yours,
THE NEW BRUNSWICK CHEMICAL COMPANY
The Finish Sells the Goods

Sizes—Solvents—Softeners
Waxes—Waterproofs—Soluble Oils

The New Brunswick Chemical Company
Newark, N. J.
REPRESENTATIVES AT
BOSTON-PROVIDENCE-CHATTANOOGA-ATLANTA

We know of no better way to prepare your warps for weaving than to use in your size mixture

HAWK
THIN BOILING
STARCH

and

SOLUBLE
WHEAT STARCH
BINDER

Let us show you why

STEIN, HALL & CO., INC.
61 BROADWAY
NEW YORK

We have been serving the Textile Industry since 1866

Boston
Providence

Charlotte, N. C.

Philadelphia
Troy

QVALITY COLORS
UNITED STATES COLOR AND CHEMICAL CO. INC.

Anthranol Chrome Blue Black AR

Dyes chrome mordant or top chromed. Recommended for fast shades of navy blue or all classes of stock. On account of its shade, level dyeing properties and solubility it is especially suitable for piece dyeing

Anthranol Chrome Brown W

Dyes chrome mordant or top chromed. Is fast to light and fulling. The most level dyeing brown on the market.

Acid Chrome Blue F 4 B

Similar to the pre-war Chromotrope F4B. Of special interest for dyeing piece goods to leave silk white.

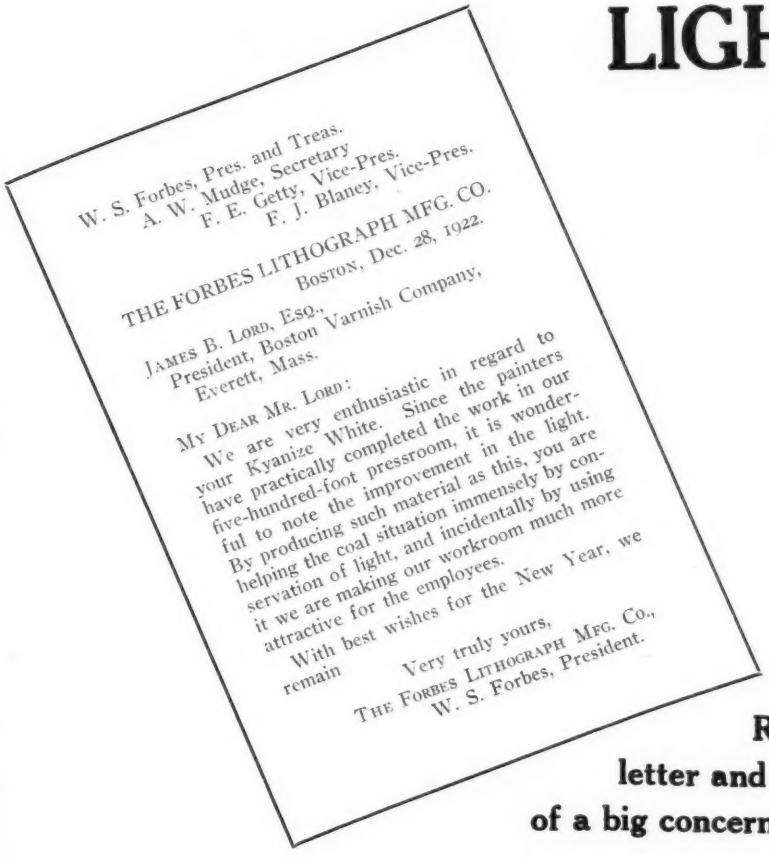
United States Color & Chemical Company, Inc.

93 Broad St. Boston, Mass.

New York Office: 25 Howard St.

FACTORIES:
NEW ENGLAND ANILINE WORKS, Inc.
Ashland, Mass.

GARFIELD ANILINE WORKS, Inc.
Garfield, N. J.



W. S. Forbes, Pres. and Treas.
A. W. Mudge, Secretary
F. E. Getty, Vice-Pres.
F. J. Blaney, Vice-Pres.

THE FORBES LITHOGRAPH MFG. CO.

Boston, Dec. 28, 1922.

James B. Lord, Esq.,
President, Boston Varnish Company,
Everett, Mass.

My Dear Mr. Lord:

We are very enthusiastic in regard to your Kyanize White. Since the painters have practically completed the work in our five-hundred-foot pressroom, it is wonderful to note the improvement in the light. By producing such material as this, you are helping the coal situation immensely by conservation of light, and incidentally by using it we are making our workroom much more attractive for the employees.

With best wishes for the New Year, we remain

Very truly yours,
The Forbes Lithograph Mfg. Co.,
W. S. Forbes, President.

LIGHT—

Next to labor the most important factor in your production

Read the accompanying letter and see what the president of a big concern says about

BOSTON MILL WHITE

The ideal white for interiors of factories, Mills, and all such buildings, equally as good over wood or brick. Sample panel and material gladly sent either factory or mill executives.

Send Coupon

BOSTON VARNISH COMPANY

Everett Station

Boston 49 MASS.

COUPON

BOSTON VARNISH COMPANY,
Everett Station 49, Boston, Massachusetts.
Gentlemen:
Kindly send us panel showing your BOSTON MILL WHITE.
Also let us have your prices.

ESSEX DYESTUFFS

DIRECT YELLOW CF
CHRYSOPHENINE CONC.
DIRECT YELLOW 2G
DIRECT FAST YELLOW B
COTTON YELLOW 5G
DIRECT BROWN 2R
DIRECT BROWN 2Y

DIRECT FAST BROWN M
DIRECT ORANGE R
DIRECT ORANGE 2RE
DIRECT ORANGE 5RE
DIRECT PINK NY
DIRECT PINK 2Y

DIRECT PINK SX
DIRECT FAST SCARLET B
ERICA 2GN
DIRECT ROSE FFB
DIRECT ROSE NB
DIRECT GREEN 2B
CHROME GREEN B CONC.

ESSEX ANILINE WORKS, Inc.

Manufacturers of Aniline Colors.

88 Broad Street, Boston, Mass. Factory at South Middleton, Mass.

The Grasselli Chemical Co., Sole Sales Agents, 117 Hudson St., New York City

AMERICA'S LEADING BLACKS

AMIDINE FAST BLACK FF EXTRA
(Pre-war prototype: Columbia Black FF Extra)
A green shade of Black, FAST TO ACID, MILLING, also adopted for dyeing of delicate shades of Gray, and for the dyeing of Unions.

KROMEKO FAST BLACK F EXTRA CONC.
(Pre-war prototype: Diamond Black F)
A Chrome Black suitable for METAL MACHINE DYEING, fast to light, fulling, and recommended for raw stock, slubbing and piece dyeing.

AMIDINE DEVELOPED BLACK B H S W
(Pre-war prototype: Diamine Black BH)
Produces a deep bloomy shade of Jet Black when diazotized and developed; suitable for hosiery work and piece dyeing, and having the property of leaving silk white. It is also recommended for Speck Dyeing.

ACEKO BLACK 10B HIGH CONC.
(Pre-war prototype: Napthylamine Black 10B Conc.)
An Acid Black of the highest purity and concentration, suitable for dyeing of worsted material and woolens, giving deep shades of Black with a greenish tone.

Send for Samples and Prices

ESTABLISHED 1876

JOHN CAMPBELL & COMPANY, 75 HUDSON STREET, NEW YORK, N.Y.

American Dyestuff Manufacturers

BRANCHES

BOSTON CHICAGO PROVIDENCE SAN FRANCISCO PHILADELPHIA TORONTO

"STANDARDS EVERYWHERE"

UNITED CHEMICAL PRODUCTS CORPORATION

IMPORTERS, EXPORTERS AND MANUFACTURERS
YORK AND COLGATE STS., JERSEY CITY, N. J.

ANILINE COLORS

ACID DIRECT BASIC
CHROME AND SULPHUR

UCPC

SUMAC EXTRACT

LOGWOOD, HEMATINE,
GAMBIER, FUSTIC, ETC.

CHEMICALS

SOLUBLE OILS, SOAPS, SOFTENERS, SIZES, GUMS AND FINISHES

CHARLOTTE, N. C. ——BRANCHES—— PAWTUCKET, R. I.

F. E. ATTEAUX & COMPANY, Inc.

172-178 Purchase Street, Boston

Sole Selling Agents for

Palatine Aniline & Chemical Corp.

Poughkeepsie, New York

New Product

Empire Coralline—for Wool and Silk

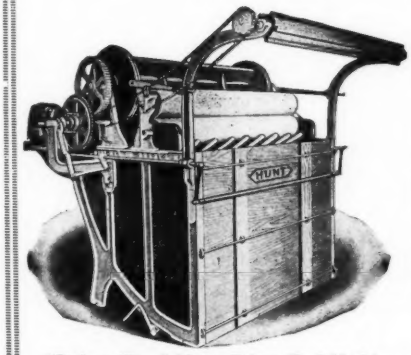
Brilliant color of exceptional fastness to light and milling.

F. E. ATTEAUX & COMPANY, Inc.

BOSTON NEW YORK PHILADELPHIA CHICAGO

Specializing

Bleaching and Dyeing Machinery
for
Textile Fabrics



"Rodney Hunt" Motor Driven Reel Machine

Fulling Mills

Washers

Reel Machines

Carbonizing Machines

RODNEY HUNT MACHINE CO.

46 MILL STREET ORANGE, MASS.

Textile Machinery—Wood Rolls—Water Power Equipment

1816 CHEMICALS *1922*

"Over a Century of Service and Progress"

BLEACHING POWDER

FINISHING MATERIALS

FORMIC ACID

COLORS

GUMS and WAXES

DYESTUFFS CAUSTIC SODA

INNIS, SPEIDEN & CO.

Manufacturers, Importers, Exporters of Industrial Chemicals

46 Cliff Street New York

BRANCHES:

Chicago Philadelphia Boston Cleveland Gloversville, N. Y.

DYELENE PRODUCTS

Reg. U. S. Pat. Off.

To Users of Developed Blacks

We call attention to the following DYLENE PRODUCTS of which we are the manufacturers:

META TOLUYLENE DIAMINE

Powder or Crystals

DEVELOPER B **DEVELOPER T**

All of Superior Quality and Guaranteed Purity

Samples and Quotations on Request

DYE PRODUCTS AND CHEMICAL COMPANY

200 Fifth Avenue, New York Works, Newark, N. J.

OUR ACID COLORS

Meet most exacting requirements for colors of this nature to be

FAST TO LIGHT

JENNINGS & COMPANY

INCORPORATED

93 Broad Street Boston, Mass.

HOWES PUBLISHING CO.,
Woolworth Building, New York.

.....192...

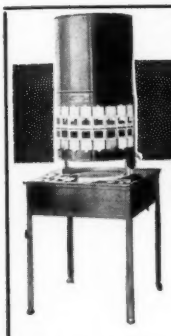
Please enter my subscription for the American Dyestuff Reporter for one year from date, for which you may bill me $5.00.

.....

.....

Canadian Postage $5.50; Foreign $6.00.

.....



Will it Fade? Ask the

FADE-OMETER

Standardized Sunlight

THE TEXTILE CHEMIST

finds it a very simple matter to make tests for fastness to washing, to chlorine, to rubbing and to perspiration, but, when it comes to fastness-to-light, he has an almost impossible job on his hands unless he uses the Fade-Ometer.

However, the Fade-Ometer is so rapid and reliable in its action and so conveniently operated that it seems strange any up-to-date plant should continue to put up with obsolete testing methods.

More about the Fade-Ometer and its value to **your** business in Fade-Ometer Bulletin No. 60. Let us send you a copy.

Atlas Electric Devices Co.

364 W. Superior St. **Chicago, Illinois**

New York
F. SCHLAYER
7 Pine St.

London
A. D. LANG, LTD.
4, Vigo St., W-1

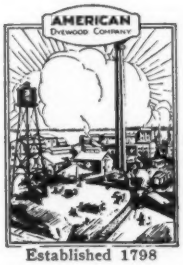
THE MOST POPULAR SHADES

of the season, in dyestuffs of known quality and uniformity, backed by our service department always ready to render advice and assistance,—this is the combination for good results enjoyed by our customers. Try us.

Send for Samples

AMERICAN DYEWOOD COMPANY

NEW YORK BOSTON PHILADELPHIA HAMILTON, ONT.
Works at CHESTER, PA.



Established 1798

I. LEVINSTEIN & CO.

INCORPORATED

281-5 Franklin Street

Boston, Mass.

offer a

full line of

American made

and

British made

DYESTUFFS

They represent

British Dyestuffs Corporation, Ltd.
Manchester, England

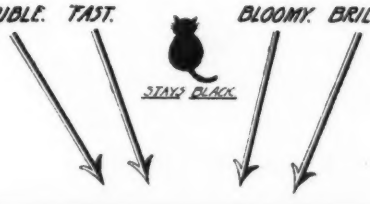
They are introducing to this country

DUROPRENE — *An acid and alkali proof varnish*

VELVONA — *A new inert base and filler*

SULPHUR COLORS

SOLUBLE. FAST. BLOOMY. BRILLIANT.



ATLANTIC PATENT BLACK

ATLANTIC YELLOWS.
ATLANTIC BLUES
ATLANTIC BROWNS.
ATLANTIC MAROONS.
ATLANTIC GREENS.

ECONOMY.
Low percentage is required to produce a deep brilliant black.

Uniformity
Uniformity of atlantic products can be always depended upon

ATLANTIC DYESTUFF COMPANY
Portsmouth N.H.
Newyork Charlotte Chicago Philadelphia Providence

Anthrole Oil

Used in the Dye Bath!

To eliminate harshness in the stock.

Assists in reducing waste on the cards.

Productive of brighter and faster shades in dyeing.

ARKANSAS CO., Inc.

253 Broadway

New York City

Established 1895

BOSSON & LANE

Manufacturers of

The Original

BLEACHING OIL

for boiling out Cotton, to produce a foundation for a Pure White

High Grade Sulphonated and Saponified

CASTOR OIL PRODUCTS

Para Soap Oil

Solvents and Assistants for cleaning all Textiles

B & L Bleachers' Bluings and Tints

Works and Office, ATLANTIC, MASS.

Consult Us About Your Dyeing Problems

The services and advice of an expert chemist and a well equipped laboratory are at your disposal without cost, except when special research or experimentation is necessary, when the charges will be of a minimum nature.

American Dyestuff Reporter

Woolworth Bldg. New York City

In the dyeing of Wool Felts there are two essentials, one is thorough Penetration and the other is Levelness of Dyeing.

Silk Brown G

answers both of these requirements. Every dyer of Wool Felts should be familiar with this color.

ALTHOUSE CHEMICAL CO.

READING, PA.

The L. B. Fortner Co.
102 Pearl St., Boston, Mass.
Sole Selling Agents for New England.

Contents of This Issue

April 9, 1923

The Use of Colorimetry and Other Branches of Physical Optics in Color and Textile Processes 271
Hibbard S. Busby

Handy Graphics—VII (conclusion) "Kinks for Chartists" 273
Charles F. Goldthwait and John E. Hoff

Abstracts of A. C. S. Dye Division Papers, Spring Meeting, 1923 275

Scientific Washing. Part III: Textiles Before and After Wear..... 277
F. H. Guernsey

Italian Government Publishes List of Colors Prohibited for Use in Soaps and Toilet Preparations 280

Editorials.
Common Sense Co-operation and the Dye Tariff 283

Review of Recent Literature..... 284

Foreign Trade Opportunities..... 285

Recent Patents 287

Some Practical Gasket Hints..... 289
Henry Bohmer, Jr.

Mercury Arc Lamps in Dye Testing..... 293
Oscar R. Flynn

Nineteenth Knitting Arts Exposition Surpasses Former Triumphs 298

Official Regulations for the Entry and Appraisement of Articles Dutiable Under Paragraphs 27 and 28 of the Tariff Act of 1922. Including the List of Non-Competitive Colors 299

Bleachers!

Your Selling Agent must cut prices if your product is not superior.

Avoid this by giving him better bleached goods, such as are permanently white without weakening and of greater softness and elasticity.

All this only possible by Solozone-processing.

Ask us how if you don't know.

THE ROESSLER & HASSLACHER CHEMICAL CO.
New York

INDANTHRENES

Your inquiries are solicited for Indanthrene, Helindon, Thio-Indigo, Hydron, Algol and other Vat Colors. The following is a list of some of the more important which we are prepared to furnish from stock or for import:

Indanthrene Yellow GK
Indanthrene Orange RRK
Indanthrene Orange 6RTK
Indanthrene Brown G
Indanthrene Brown R
Indanthrene Red 5GK
Indanthrene Corinth RK
Indanthrene Brilliant Violet BBK, RK
Indanthrene Blue RK
Indanthrene Blue GC
Indanthrene Blue 5G
Helindon Pink R Extra
Helindon Pink B Extra
Helindon Red 3B
Helindon Orange R
Helindon Black Vat T
Algol Brilliant Orange FR
Algol Brilliant Violet R, 2B
Algol Brilliant Red 2B
Hydron Navy Blue C

H. A. METZ & CO. Inc.
One-Twenty-Two Hudson Street New York City.
Boston Philadelphia Providence
Chicago Charlotte San Francisco

WHAT WILL THE DYE DO?

ASK the "National" Salesman what the dye will do. Put your problem up to him—he is qualified to understand your dye requirements. He has the support of the "National" Laboratory and the "National" organization.

"National" is equipped to give you dyes that will do exactly what you want them to do.

National Aniline & Chemical Co., Inc.
40 Rector Street, New York, N.Y.

Boston	*Philadelphia*	*San Francisco*
Providence	*Charlotte*	*Toronto*
Hartford	*Chicago*	*Montreal*

"NATIONAL" DYES

NATIONAL U.S.A. DYES

AMERICAN DYESTUFF REPORTER

"Circulated Everywhere Dyestuffs Are Used"

Devoted to the practical application of dyestuffs in all industries; especially to textile chemistry—the science and practice of scouring, bleaching, dyeing and finishing.

VOLUME XII | NEW YORK, APRIL 9, 1923 | NUMBER 8

The Use of Colorimetry and Other Branches of Physical Optics in Color and Textile Processes

General Scope—Manufacturing Needs—Methods Used—Apparatus—Problems—Materials—Color—Lighting —Research Results Available—Art to Process Relation

By HIBBARD S. BUSBY

Consulting Colorist

General Scope

At the basis of all process work a knowledge and accurate control of the materials entering into the process is most vital. In order to do any control work with reasonable hope of success, this problem of prorating the materials in terms of their cost and effective property is vitally linked with the later problem of the operating control of the process. It is furthermore necessary that a standardization check be made on the quality of output of any reliable line of manufacturing effort. This is part of the trade reputation and a saving of much embarrassment and cost in the matter of later credits.

The work outlined in the following paragraphs has to do with these features as well as giving some idea of the nature of the types of research into properties of the various materials used and the basis of predicting their effects prior to actual use.

Manufacturing Needs

A large number of fields of effort are disclosed by a careful examination of almost any manufacturing business where the product includes work in color, texture, finish and other items of quality. These are listed briefly as follows:

Ability to make rapid relative evaluation tests of vital materials entering into the process, together with comparative cost tests of the same materials.

Standardization of the elementary materials and the final product against fixed references of measurement.

Control of degree of quality.

Determination of *nature* of faults in process and how these are corrected.

Proper layout and code for units and methods of inspection.

Exactly written definitions of appearance which must be independent of the necessity of retaining any samples whatever.

The discovery of process defects during preliminary stages of process in order to effect savings before later costly process is superimposed upon defective or injured material.

Illumination of work, proper lighting for inspection and special lighting for the enhancement and discovery, by magnifying, of not easily noticeable faults in materials, etc.

Methods Used

In order to accomplish the various results which may be desired on the large project, several of the methods of pure science are applied to the industrial problem. Chief among these are spectroscopy, photometry, colorimetry, the nature of the structure and distribution of elementary substances in a mixture, short cuts (through arbitrary reference to secondary standards, ratios, etc.), instrumental control of small degrees of change in process and light sensitive substances. In general, the use of light-sensitive control is limited to one of *positive* change rather than of *degree* of change.

Apparatus

Considerable question has arisen as to why optical methods should be substituted for the regular eye method of judging an appearance which is, after all, finally rated by the unaided eye. The answer to this objection is that during the intermediate stages of process, many defects

which are hardly noticeable, are later magnified into strongly appearing contrasts and it is quite vital to have this information at the start, whether for check comparisons, simple measurement, or fundamental research, and it will vitally affect the choice of the apparatus to be used. Some people want the earth and are surprised if its cost bears a proportionate relation, not only to the area acquired, but the cost of surveying it for habitability. Unfortunately, some very bad impressions have got about for this reason as to the cost of doing this type of work. Of course, it must be apparent that one central bureau can more economically serve a number of clients than can the client serve himself from his own installation.

The problem of measuring a color or texture effect is entirely different from that of reproducing the color so that the man who has to use it can see it, and the types of apparatus for the two problems differ widely in cost and general make-up.

The instruments regularly used in these types of work may be grouped into three general classes, namely, for inspection, for control and for fundamental research. Those in the first-named class are quite simple and inexpensive, in the second-named class are more expensive and slightly more complicated. Those for research are extremely expensive, complicated, and can only be handled with any degree of success by the expert. Sometimes it is possible to combine all three types of work in one instrument. This is an achievement, and when it can be accomplished, is worth the investment. Research instruments must generally be capable of handling physiological, quantitative (refinement), and purely theoretical problems. The majority of them, unless specially made, are entirely inadequate in industrial applications except where the industrial laboratory has a pure-science branch.

There is an increasing number of instruments being produced by American manufacturers and a goodly percentage of these are applicable to works problems. A few instrument manufacturers have been far-sighted enough to assist in the development of very special instruments. These people will undoubtedly get the volume of future business, as all research waits on apparatus and apparatus on initiative.

The problem of when, where and how to use each type of instrument and to determine when the class of work falls within the scope done better without dependence upon instruments, should properly follow a very careful survey of the problem; in fact, it is utterly futile to give a snap judgment of this matter.

PROBLEMS

Materials

The relative tinctorial strength, fastness, dyeing power, color neutralizing power of basic material upon the coloring matter used, etc., can all be determined by instrumental methods and in nearly every case far more rapidly than by chemical means, to say nothing of the degree of precision obtained thereby.

Color

Standard colors may be registered against numerical records, measured as desired, and filed away for permanent reference without the necessity of retaining any samples whatsoever.

Related colors may be aligned into properly graded steps and groups and a better salable arrangement of colors presented for inspection.

An inspection (by color measurement) of production lots from process, and the evaluation of the process work from this data, is but one more step of the problem.

Lighting

Various effects of materials in a mixture may be enhanced by dint of illumination of these materials with special regions of the spectrum and by measurement of the response to this illumination, standards of inspection are set up.

Matching units must be installed and properly controlled to give uniform results.

Quality inspection units must also be placed at strategic points and all placed under the control of the laboratory.

The work must be properly lighted during its operation; one of the effects obtained by such lighting is increased ability to properly register fine-pattern printing. This sort of installation should be on the same basis as the standard lighting of the master units in the laboratory.

Research Results Available

A number of very difficult problems have been brought to solution and among these may be mentioned fundamental knowledge of the nature of materials and the effects of mixing them, their properties, their application, the ability to predict the effect of their addition to certain established processes and the ability to register each step in the building up of the process, or a detailed study of it with a view to prorating the value or the detriment of any item or process introduced.

ART TO PROCESS RELATION

A scheme of color, texture and finish may be accurately adjusted to promote the most desirable and salable qualities; all sorts of effects of contrast, harmony, etc., controlled thereby and if this work is begun with the designer, the quality of the design may be greatly improved.

It is vital to effect layouts between the art and process departments of a business in order to produce the best possible combination of above adjustments which are possible with the materials available, and the success of these methods will be measured by the degree to which the expert is granted the contact and advisory relation with these two vital factors of the business.

Handy Graphics—VII

"Kinks" for Chartists

Many Data on a Small Sheet—Points on Drafting Charts—Authorities on the Subject

CHARLES F. GOLDTHWAIT
Baltimore Processing Company, Baltimore, Md.

and

JOHN E. HOFF
Klearflax Linen Looms, Inc., Duluth, Minn.

Conclusion of a Series on Textile Chemical Uses of Ratio Paper and Logarithm Scales

HAVING suggested a number of uses for charts, it is only appropriate to offer a few rules and "kinks" to assist in their construction.

Probably the best brief outline of the general principles of charting is contained in the report on "Standards for Graphic Presentation," by a joint committee from a number of national associations. It is given briefly in several books (1, 2), has been issued as a pamphlet (14), and was reprinted complete in the Journal of Industrial and Engineering Chemistry in March, 1916, so it is readily available.

Many times a chart will serve to emphasize facts already known and its display will incite far more activity in improving or correcting existing conditions than merely presenting the case in words or showing the same data in figures. Care should be taken, therefore, to make the chart just as effective as possible, both by careful design and careful drawing, especially if it is to be presented to a superior.

One of the usual rules, that the zero line should always be shown, cannot be followed in using ratio paper. Usually, however, if the lowest cycle begins with 1 or 10 it is near enough for all practical purposes as the curves are judged by their slant rather than by their distances from the bottom. It is even possible to work out a little system for comparing slopes with lines drawn to represent known per cents of decrease or increase.

To Show Negative Numbers

Ratio paper has limitations. In addition to those mentioned in earlier articles it cannot be made to show gains and losses on the same sheet. Since there is no zero, there can be no negative numbers. Negative values can be shown by themselves, however, by inverting the sheet, or a dummy zero line can be inserted between log rulings running in opposite directions, as shown in *Fig.* 1 which is borrowed from Haskell (2).

Such a line does not mean much as points plotted on it do not bear a correct relation to the rest of the graph, but it makes a little better looking chart. It is usually advised also that cumulative curves do not work well on logarithmic ruling.

Avoid Large Charts

In comparing very large and small quantities which might extend over a range of four, five or more "decks," it is not necessary to spread them over such a large territory, but they can be grouped closer together for easy comparison, even within the same cycle. It is only necessary to see that they are not too crowded and that suitable scales are provided. In many cases this results in getting information on a small size of sheet that might

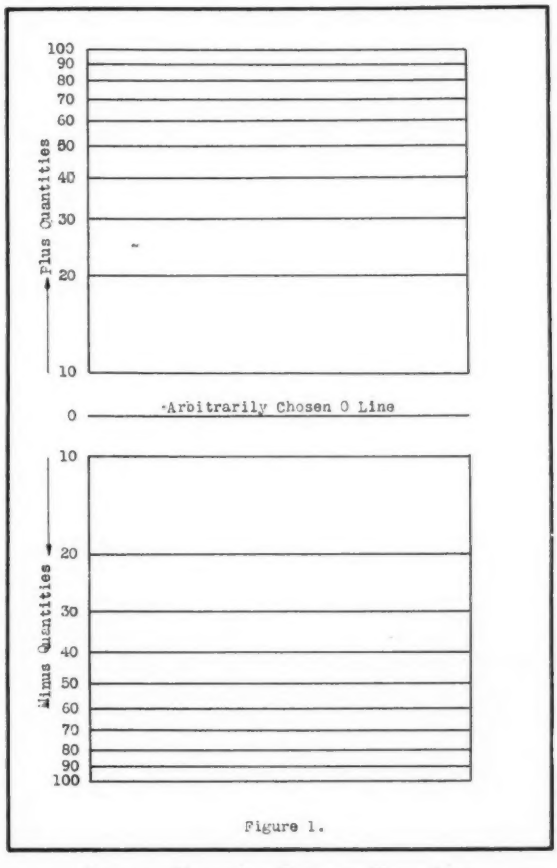


FIG. 1—*Use of a Dummy Zero Line*

require an ordinary ruled paper several times as large. In other words, you can do what is impossible on ordinary paper, shift a curve for comparison without changing its shape.

Among a few simple rules and suggestions for charting the first is to be sure to "get" the numbering. It is not hard to remember that the boundaries of the cycles are 1, 10, 100, etc., but it is easy to forget that the 2 above 10 is not 12, but 20. In fact, about the only difficulty is in passing from one cycle into the next.

Transparent Paper a Great Convenience

There are a great many kinds of chart papers on the market but for most purposes those printed on bond are

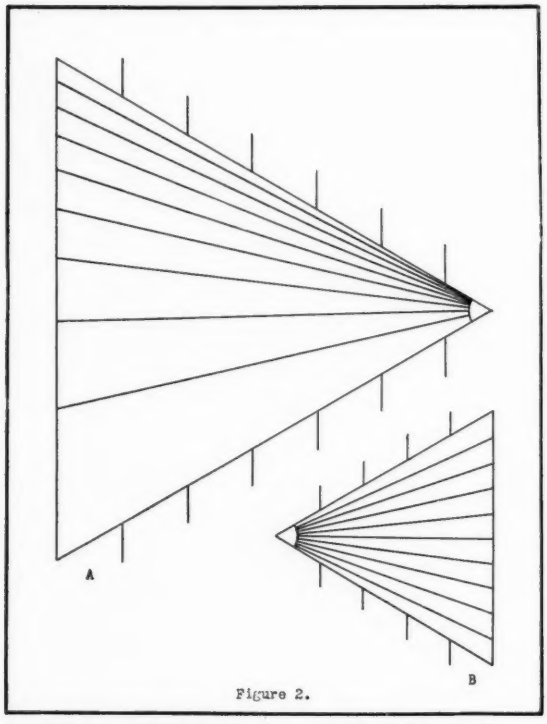


Fig. 2—*Dividing Scales (A) Logarithmically (B) Into Equal Parts*

the most convenient. They are easily reproduced by blue printing and, for actual use, the prints are just as good. The original can be filed and always will be in good condition for further prints.

If figures and lettering are typewritten, they may not be dense enough for good prints but excellent results can be obtained if a carbon paper is set to print on the back of the sheet while the typing is being done.

It may be found better when using transparent paper or tracing cloth to do some of the drawing on the back where erasures will not affect the printed rulings.

Do not print figures in pencil and then type over them with the idea of erasing afterward. It simply won't work.

For reading charts, especially for computation, a transparent celluloid strip ruled lengthwise with a fine black line is very convenient.

Reproducing Log Paper and Scales

Sometimes a scale is required different from anything at hand. That is, one may have a four-inch cycle and want a five for some specific purpose. In such a case the simplest procedure would be to draw a five-inch line in the desired position on a piece of transparent paper. Then lay this sheet over a four-inch cycle so that the line crosses it diagonally and just falls within its limits. The scale is then made by marking the points where the line crosses the rulings of the lower sheet.

Methods of projecting the distances so as to reproduce them on a larger or smaller scale can also be easily worked out.

Finally, suitable scales can be constructed with the aid of logarithm tables. For example, a twenty-inch scale represents logarithms from 0 to 1. Writing the upper limit 1.000, we can assume that it consists of 1,000 parts, each with a value of 0.02 inch. Multiplying 0.02 by the first two figures of the logs of the numbers desired in the graduations will give the distances to be measured to locate these points.

Still another method of reproduction is shown in *Fig.* 2A. The vertical line at the left is a copy of a log scale from a piece of chart paper. To get a similar scale of any shorter length, place the desired line, drawn on a piece of transparent paper, directly over the figure parallel to the base and just falling within the sides of the triangle. Mark the subdivisions and the scale is made.

Having the main part of a scale, the subdividing is a little puzzling unless the distances can be projected from some ready-made graduation. This can be settled in about the simplest manner by inspection of the corresponding part of a sheet of ratio paper. If ten subdivisions are of almost exactly equal length, then the chart being constructed can be divided equally in that portion by the aid of *Fig.* 2B. If, however, the first of the ten subdivisions is appreciably larger than the last, the chart should be carefully graduated in this section by projecting from a suitable scale or by individual calculation.

When it comes to publication, Brinton (15) is authority for the following statement, which appears to summarize the matter very well: "If a line cut is made all the lines show quite sharply. If, on the other hand, a black ink drawing on green cross-section paper is photographed and used as a half-tone, the co-ordinate lines show plainly enough but the curve stands out much more prominently. Often the effect is much better."

The half-tones in this series were photographed from drawings on olive ruled paper while the other illustrations are ordinary line cuts.

"Patois" of Charting

To assist in the purchase and use of charting papers, and perhaps at the risk of repeating ourselves in some

details, a few lines will be devoted to "technical terms." The scale from 1 to 10, or from 10 to 100, etc., is called a "cycle" or "deck." Paper ruled with logarithmic scales in both directions is true logarithm paper while that with logs in one direction only is sometimes called logarithmic so it is best to specify carefully in ordering. The latter is also known as "ratio," "percentage," "semi-logarithmic," or by the trade name, "arithilog." Paper with the ordinary equidistant spaces is called "arithmetic," "natural, "co-ordinate," "rectilinear," "difference," etc.

In spite of our numerous illustrations, there are many uses for logarithm paper on which we have not touched at all. Recent examples have been noticed covering absorption spectra, charting viscosities of lubricating oils against temperatures and there is now a system of automatically charting hydrogen ion concentrations on a ratio sheet.

In conclusion, we will mention again several sources of information on graphic charts, from some of whom ideas have been borrowed and adapted to textile uses; and if anyone has been led by this brief exposition to desire to study further into the subject of ratio charts or any other kind of charting, these are among the best authorities. The only excuse for this particular selection is that the writers have used all of these references. Others that have not been available may be as good.

References

Only the main references on charting proper are given here.

(1) "How to Make and Use Graphic Charts." Allan C. Haskell. Codex Book Company, New York. 1919.

(2) "Graphic Charts in Business." Allan C. Haskell. Codex Book Company, New York. 1922.

(4) "The Ratio Chart and Its Applications." P. A. Bivins. Industrial Management, July to October, 1921, inclusive.

(7) "Empirical Formulas." Running. Published by Wiley, 1917.

(14) "Joint Committee on Standards for Graphic Presentation." Pamphlet published by A. S. M. E., New York. Same data also given in J. I. E. C., March, 1916.

(15) "Graphic Methods for Presenting Facts." Willard C. Brinton. Engineering Magazine Company, New York. 1920.

(16) "Graphical Methods." William C. Marshall. McGraw Hill Book Company, New York. 1921.

Abstracts of A. C. S. Dye Division Papers

Spring Meeting, April 2-7, Inclusive, New Haven, Conn.

The Electrolytic Preparation of Amino-Salicylic Acid

By E. K. Strachan

Benzene-azo-salicylic acid may be reduced electrolytically to 5-amino-salicylic acid and aniline, the latter being recoverable. A diaphragm cell with an amalgamated lead cathode in 2 to 4 per cent sodium hydroxide solution gave the best results at current density of 0.2 amperes per square inch. The current efficiency is 70 per cent. The material yield is 95 per cent of theory. Means of improving the material yield are suggested. The author urges quantitative study of organic electrochemical processes, as most of those reported in the literature are barely more than qualitative.

The Analysis of Dyes by Titanous Chloride

By W. S. Calcott and F. L. English

The application of the $TiCl_3$ titration to representative members of the triphenylmethane and azo classes is described. A direct titration procedure of general applicability to the former is suggested, while both direct and back titration methods are given for the latter, the exact procedure, as well as the solvent used, depending upon the individual azo compound under consideration. A single analysis can be conducted in ten to twenty minutes, the results being accurate to about 0.5 per cent.

The Work of the Color Laboratory

By Joseph A. Ambler

The problems studied in the color laboratory are those dealing with the basic reactions of dye chemistry and with the physical and chemical properties of the dyes themselves, as well as of the crudes and intermediates from which they are made. Only those problems which have a bearing on the industry as a whole are undertaken. Special stress is laid on the study of improved analytical methods and tests for purity in order that means may be found for improving the quality of the dyes produced in America.

The work on certified food colors, biological stains, furfural, thymol and spectroscopy of dyes is briefly described.

Absorbed Moisture and Water of Crystallization in Certain Common Dyes

By H. Wales and O. A. Nelson

Vapor pressure-water content curves were obtained for methylene blue, crystal violet, erythrosine, magenta and tartrazine, for the purpose of determining whether the water present in these dyes was adsorbed or held as water of hydration.

Only crystal violet and tartrazine showed hydrate formation, giving 9, 6, 4, 3, 2, and 14, 10, 6, 3 mols respectively. There was the equivalent of one mol of water in erythrosine which was impossible to remove by the method employed. Taking this into account a new structural formula was suggested for this dye.

The Spectrophotometric Identification of Dyes: I—Acid Dyes of the Patent Blue Type

By Walter C. Holmes

The degree in which the intensity of the absorption of solutions of dyes is modified by variations in concentration, solvent, alkalinity acidity and other conditions is dependent upon the degree of alteration of the dye in molecular form or aggregation and the latter, in turn, is conditioned upon constitutional differences. The quantitative measurement of intensity of absorption under such variation in conditions, accordingly, affords spectrophotometric ratios, or constants which have important diagnostic value for purpose of identification.

An analytical scheme for the identification of acid blues of the Patent Blue type is outlined in which such spectrophotometric ratios are employed ot supplement the spectroscopic data customarily obtained.

The Spectroscopy of Dyes

By Walter C. Holmes

The value of the spectraphotometer as an aid in research on dyes is discussed in a general way. Its value as an aid in establishing their constitution and identity is brought out, as well as its limitations. As a check in dye evaluation, it should be used only with great discretion in the interpretation of results. It promises valuable results in the study of changes of molecular form, of molecular aggregation, and of lake formation. Examples of its use for following the reaction of lake formation are given. The possibility of obtaining valuable data in regard to the presence or absence of chemical combinations between dye and fiber is pointed out.

Volumetric Estimation of Auramine

By Walter C. Holmes

A volumetric method for the evaluation of auramine is given. The auramine solution is titrated with the sodium salt of indigo-disulphonic acid until a drop of the solution containing the precipitated lake, when spotted on filter paper, showe a faint ring of blue beyond the green lake. The most favorable conditions for the titration and the mechanism of the reaction are given in detail. The values obtained check very well with those found by the dye tester. The presence of common impurities in the commercial dye does not interfere with the accuracy of the method.

Sulphonation of Para-Cymene

By Max Phillips

The melting point curve of alpha and beta cymene-sulphamides was determined. Using this as a means of determining the percentage of alpha and beta cymene-sulphonic acid, a quantitative study of the sulphonation of p-cymene was made with a view of determining the experimental conditions favorable for the production of beta-cymene-sulphonic acid. The effect of temperature, time, concentration of acid and that of certain inorganic catalysts, was investigated. In the various experiments performed, it was found that the percentage of beta-cymene-sulphonic acid varied only from about 8 to 16 per cent of the total cymene, mono-sulphonic acids produced.

Naphthalene-Sulphonic Acids V—Sulphonation of Naphthalene in the Vapor Phase

By J. A. Ambler, D. F. J. Lynch and H. L. Haller

This investigation is a continuation of the work of Ambler and Gibbs U. S. Patent 1,390,241. Concentrated sulphuric acid is caused to descend over quartz pebbles in a cast iron tower, which is heated and maintained at a temperature of 220 to 245 deg. Cent. Naphthalene is heated to boiling and its vapors are passed up through the tower. The vapors come into contact with the descending hot sulphuric acid and are absorbed by it with the formation of naphthalene-disulphonic acids and water. The water, liberated as steam, together with excess naphthalene and other volatile products of reaction, escape through the top of the tower into suitable condensers. The sulphonic acids, together with the excess unused acid, are carried downwards by means of gravity and discharged from the bottom of the tower. Thus the reaction product is kept at the high temperature of the tower only for a short interval of time, hence preventing the transformation into the undesired isomeric naphthalene-2, 6-disulphonic acid. The product consists essentially of naphthalene-2, 7-disulphonic acid, a small amount of 2, 6-naphthalene-disulphonic acid and traces of the beta-monosulphonic acid. The paper also contains a diagram and description of the apparatus.

Naphthalene-Sulphonic Acids: VI—The Quantiative Estimation of Naphthalene-2, 6-and 2, 7-Disulphonic Acids

By Herbert L. Haller and D. F. J. Lynch

The proposed method is similar to one by Ewes (Rec. Trav. Chim. 28 (1909 p. 298)), who estimates beta-monosulphonic acid of naphthalene in the presence of alpha-monosulphonic acid by determining the mutual influence on the solubility of their lead salts in water at 25 deg. Cent.

In the present paper lead salts of 2, 6- and 2, 7-naphthalene-disulphonic acids are prepared and the solubility of known mixtures of the two salts is determined. The procedure has been to add an excess of lead 2, 6-naphthalene-disulphonate to 100 cc. of water and to this add known quantities of lead 2, 7-naphthalene-disulphonate and then determine the total solubility at 25 deg. Cent. The results obtained are plotted in a curve. Thus by determining the solubility of a weighed quantity of an unknown mixture of lead 2, 6- and lead 2, 7-disulphonates, with the aid of the curve, the proportion in which two isomers are present in the mixture can be ascertained.

(Concluded on page 293.)

Scientific Washing

III—Textiles, Before and After Wear

Responsibility of the Textile Manufacturer—Mill Processes and Their Effects—The Problem of "Seconds" —Responsibility of the Consumer—Responsibility of the Launderer—The Detergent—Source Of Efficiency in a Detergent—Bleaching—Sours—Rinsing

By F. H. GUERNSEY

Chief Chemist, the Cowles Detergent Company, Lockport, N. Y.

Textiles, Before and After Wear

THE psychology of the attitude of the public at large toward the power laundry owner presents an odd and colorful picture.

To him is delegated the responsibility of cleansing garments, and the owner of the latter expects everything back but the dirt!

That is all well and good so far as it goes, but we must admit that the laundryman is entitled to have a sound piece of goods to start with.

In other words, the responsibility for the life of the garment is not solely that of the laundryman, but indeed a collective one involving the textile manufacturer, consumer and laundryman.

Responsibility of Manufacturer

The initial responsibility rests with the producers of textiles, and much of their future depends upon the fabrication of the cloth, the quality of the yarn and fiber, and the fastness of colors.

The makers of certain yarns and fabrics use care in selecting the proper stock for their product, for the simple reason that the fibers must have certain *mechanical* characteristics to enable them to convert them into the desired thread, yarn, etc. Textile machinery has been developed to a high state of perfections and the mechanical properties of the fibers must meet the requirements of the machinery. While it is true that the mechanical phase of textile manufacture is highly developed, the opposite is true of the equally important *chemical* phase of the processes.

Processes in the Textile Mill

In the case of cotton fabrics, the fibers are not usually submitted to any chemical process until the yarn has been woven into cloth. In most cases the warp threads are given a coating of sizing material (consisting of starches, gums, clay, paraffine, etc.) to aid in the process of weaving. After weaving, the fabric is submitted to the "bleaching" process to remove the natural cotton impurities and sizing materials.

The first step in the bleaching process is the "singeing" operation, which is usually accomplished by passing the rapidly moving cloth (under tension) over gas burners or iron rolls heated to a cherry red. In this operation the fiber ends or fuzz are burned off and great care must be employed to avoid a slowing down of the machinery and consequent overexposure of the cloth to the flame.

In some cases the sizing is removed by a preliminary soaking or "wetting out" in dilute acid or malt product to convert the starch into soluble compounds. Whether or not hydrocellulose, a derivative of cellulose, is formed, with a corresponding loss in mechanical strength, depends upon the care and skill of the operators.

After rinsing, the goods (which are sewed into one continuous piece several thousand yards in length) are plaited down in a boiling kier or tank and submitted to one or two alkali boils, usually of twelve to fourteen hours' duration.

This is an important operation, because usually three or four tons of cloths are treated with boiling alkali solution at one time and any deleterious action would affect the entire yardage. Care must be exercised in the selection of alkalies for this work, as the production of oxycellulose and short fiber (lint) may readily occur under unscientific conditions.

After the alkali boil, the cloth is passed by continuous process through rinse waters, sulphuric or muriatic acid sours, "chemick" or bleach, rinsed, blued, calendered, etc.

If a second boil is to be given the same cloth it is rinsed after souring and returned to the kier. After this boil it is rinsed, soured, bleached, etc., as just described.

Upon leaving the kier, the cloth is fed through porcelain pot-eyes much like a rope and passed through the various solutions in motion. These solutions are of such strength that the necessary souring and bleaching action is derived "on the run," so to say; but in every bleachery the lengths of goods break several times a day. These breaks usually occur at the points where the 60-yard pieces are sewed together in the singeing room, and the machinery must be stopped at once while the parted ends are brought together and again sewed. During this interval about a hundred yards of cloth will be lying in the sour and another

similar section will be lying in the bleach. These sections are oversoured and overbleached, but when the machinery is again started they pass on with the good material. But sooner or later the effect of such treatment will show up, possibly not until it has gone into service, and some day perhaps the consumer and the launderer will be blaming each other and neither will be right.

An exception to this process is the case where the yarn is bleached prior to conversion into fabric. The yarn is bleached in hank form and is handled more carefully than in piece-goods bleaching. Most of the bleached yarn is dyed before being woven, to produce various color patterns.

The Problem of "Seconds"

The effect of careful or careless treatment in the dyehouse is one which the layman easily observes. The correct dyes must be selected for a given fabric or yarn, and then these dyes must be correctly applied. In printing processes where acid stripping agents or "discharges" are regularly employed their action must be controlled or regulated, and any remaining chemicals should be carefully rinsed out before finishing.

So it is all through the industry; the textile producer should be keen to appreciate the effect of questionable practices in bleaching, mercerizing, dyeing, scouring and milling of wool, carbonizing of wool (sulphuric acid treatment), degumming of silk, the construction of loose-weave fabrics where the purpose for which the fabric is intended indicates a closely woven fabric, the use of short fibers where long fibers are indicated, the lack of control of humidity which results in broken threads, the unwise selection of fibers of widely differing properties for the preparation of "union" fabrics, the use of substitutes of known unreliability for the purpose intended, and the offering of "seconds" without fully acquainting the purchaser, by label or otherwise, with the fact that normal service should not be expected from such goods.

The problem of "seconds" is really a serious one. Any fair-minded person will agree that the textile manufacturer must find some outlet for defective goods, and when these goods are purchased at a reduced price they are often good values. However, these seconds are frequently passed on by middlemen who may not be conscientious enough to fully inform their prospective purchasers of the inferior quality of the goods. The unsuspecting consumer pays a normal price for the goods, and then is naturally surprised if a failure develops in laundering or in service after a few trips to the laundry. The evil of "seconds" will never be corrected until all producers attach a fixed label or mark, fast to washing, to all defective goods. This will insure protection of the producer, dealer, consumer and laundryman.

The textile industry has its problems and difficulties, as any other industry, and there is a tendency to cling to methods and processes handed down for generations. The modern and progressive manufacturer of textiles, however, is revising his processes in accordance with present-day scientific development, and this tendency is sure to be felt all along the line.

A factor of considerable importance to the cotton bleacher, dyer, printer, wool scourer, worsted mills, and others whose operations involve scouring or bleaching, has been the recent advent in the textile industry of the detergent Sol Esco. To obtain potent detergent properties without the usual destructive qualities of the strong alkalies has been the object sought in vain for many years. The novel features of Sol Esco are being readily and rapidly recognized in the industry.

Responsibility of the Consumer

Some persons seem to have the idea that the laundry owner is a sort of magician; that no matter how much they abuse their wearing apparel, the laundryman will restore it to its original condition of soundness and whiteness.

The use of towels, pillow slips, etc., for shining shoes, wiping off windows, dusting, wiping up floors, etc., simply results in the necessity of more vigorous treatment in the laundry and abnormal depreciation.

Careless spillage of medicines, storage battery acid, tar, paint, metal polishes, cosmetics, etc., and scorches produced by cigars or cigarettes, usually produce failures which may not be evident until the article is subjected to the laundering process. It is much like exposing photographic film in taking a picture. The result of the exposure—that is, the change in the sensitive emulsion—becomes apparent when the emulsion is treated in the photographer's laboratory.

Any consumer who knowingly purchases "seconds" should not criticize the launderer if a failure develops in a seemingly short period.

The consumer should also appreciate that there is considerable loss in the mechanical strength of fabrics due to wear. For instance, it has been found that the life of lace curtains is extended if they are washed frequently when merely soiled, rather than allowing them to become very dirty and washing at longer intervals.

Any consumer may greatly assist the launderer in prolonging the life of his goods if he will exercise reasonable judgment in their purchase and use.

Responsibility of the Launderer

The launderer should approach his task with faith in his customer and in his goods. If, in making or sorting the articles, possible trouble should be sensed through the appearance of one or more of the pieces, it would be better to return the articles in the soiled condition, with a memorandum attached explaining their condition and

indicating that laundering can be attempted only at the owner's risk, rather than assume responsibility or become involved in the indicated failure. Some launderers notify their customers by phone, so that if agreeable to the customer the article may be laundered and returned with the rest of the bundle.

The laundry organization should be familiar with the characteristics of the various fabrics and the best methods of laundering them from the standpoint of conserving their life as well as restoring them to a condition of cleanliness and good appearance.

One of the first and most important steps is classification as accurately as possible of the various types of goods. This separation enables the laundry owner to employ vigorous treatment where it is possible and necessary, and less vigorous methods where they are ample to accomplish the results.

The Launderer's Twofold Duty

The cleansing or washing operation is the heart of the laundering process. In this operation the launderer must clean and conserve, two essentials of equal importance. The launderer equips his plant with the best equipment, and his next duty is to properly select his cleansing materials.

The progressive plant will be equipped with a soft-water supply, the advantages of which are obvious. A good soap and alkaline soap assistants are next required. From the number of high-grade chip and powdered soaps (not "soap powders") on the market, and the fact that their actions in the washwheel are identical, the selection of a soap is a relatively easy matter.

The Detergent

The launderer must, however, focus his especial attention upon the alkaline assistant employed. There are several alkaline compounds available, among which are the raw alkalies, caustic soda, and soda ash.

Caustic soda is one of the most destructive agents that could be employed in a laundry washwheel, and is very difficult to rinse away from the fabric.

Soda ash is somewhat milder than caustic, but of its total alkali only about 11 per cent is available for cleansing purposes. It is valuable as a water-softening agent. An accidental overdose of soda ash will prove very destructive to the goods.

Appreciating the demand for something less destructive than soda ash, alkali manufacturers brought out a *duplicate* of a *natural* alkali, having a composition practically equivalent to a mixture of equal parts soda ash and sodium bicarbonate (ordinary baking soda). This helped somewhat, because the bicarbonate suppressed the hydrolysis of the soda ash present; but it was soon discovered that much of the cleansing value of the soda ash present had been sacrificed and that it was necessary to use about twice as much of these materials (called "modified sodas") to produce the same results. This resulted in much higher costs and an added burden in rinsing.

Perhaps the most important weakness of the modified sodas is the fact that sodium bicarbonate is unstable in the presence of heat, and the modifying action is temporary in the same sense that bicarbonate hardness in water is temporary hardness. When sodium bicarbonate breaks down from the action of heat, ordinary soda ash is formed and the most efficient cleansing is not obtained until this action is well developed. In fact, much better results are obtained by using modified sodas in soap builds rather than the dry form, because the cooking in the soap kettle converts much of the bicarbonate to soda ash before it is added to the wheel.

The "better results" referred to concern the cleansing efficiency only. The corrosive action of raw soda ash is still present and as undesirable as ever.

The Source of Efficiency in a Detergent

To be effective as a cleansing agent and stimulant for soap, the alkaline assistant must yield considerable active alkali or alkaline hydroxide. In fact, the cleansing efficiency is directly proportional to such yield of active alkali. For years the present problem of alkali users was to find a combination of active alkali and low corrosive action on the fibers.

Escolite and Soapalite, patented detergent alkalies, closely approach that ideal. All of their alkali is available, the total yield being several times that of soda ash, yet these detergents are about one-fourth as destructive as soda ash. For instance, the total loss in the mechanical strength of cotton is one hundred washes with Escolite and is less than that of twenty-five washes with soda ash. In the case of the use of excess materials in the wheel, such as might occur with inexperienced or careless employees, cotton has been shown to lose over three-fourths of its strength in one hundred washes when washed with soda ash, and under identical conditions Escolite caused a loss of less than one-fourth of the tensile strength.

In addition to these values, Escolite produces a superior whiteness and has a protective action on colors. The secret of this singular action is the presence of colloids in Escolite, and it is important to note that none of the competing alkalies contain these elements, and that soap, which is noted for its mildness, is a highly colloidal material.

Therefore, the wise launderer employs Escolite as his alkaline assistant and stops worrying about "alkali effect" in his washing process.

Ten Minutes for Bleaching

Bleach is perhaps the most destructive agent employed by the launderer, and its use should be limited as much as possible. It is not wise to add bleach in the early part of the suds, as the prolonged action at suds temperature produces unnecessary tendering. Five or ten minutes in the

suds or first hot rinse should be the limit, and under no conditions should lime be allowed to enter with the bleach.

Use Only Safe Sours

So far as possible, the use of sours should be confined to those which are volatile—that is, easily evaporated—so that if by chance any should be retained by the fabric the heat of ironing will drive it out.

Last, but of Equal Importance, Rinsing

Rinsing should be thorough and complete. Rinsing involves the removal of both detergents and dirt, and it would be better to give an extra rinse rather than risk the incomplete removal of impurities.

Bluing, starching, ironing, etc., are finishing operations which require care and supervision but do not involve the risks of the earlier treatments.

Summary

From the above, it is obvious that the launderer's responsibility is by no means the least of the three. He can only be expected to successfully discharge his responsibility when the producer and users of textiles co-operate to their fullest extent. Many failures attributed to the laundering process are really pre-existing defects which are merely "uncovered" in the act of cleaning.

On the other hand, if a good sound garment is turned over to a laundry for cleansing and is returned in a dilapidated condition, the responsibility clearly rests with the launderer, *because non-destructive methods of laundering all classes of goods are available.*

(Part IV of this series will follow in an early issue.)

Italian Government Publishes List of Colors Prohibited for Use in Soaps and Toilet Preparations

Dye Tariff Decision Waits Upon Politics—Cotton Dyers Look for Much Business—Sandoz Incorporates at Milan—Ruhr Invasion Sends Caustic Soda Skyward—Lira Holds Up Well in Face of Semi-Panic

Genoa, March 12, 1923.
Special to The Reporter.

THE unsettled conditions of Europe caused by the invasion of the Ruhr and Rhineland districts, and the consequent reduced exports from France, Belgium and Germany, have had the effect of making all commercial and industrial circles somewhat panicky, but did not cause, during the past five weeks, the fall in Italian values that had been anticipated by some. In the case of the dollar, an advance brought its value, after continual fluctuations, from 21 lire to 20 lire, and the English pound sterling from 98 lire to 97 lire.

Through the great press of work and the special situation created by political conditions, no decision could be

TABLE I

	February 10		March 10	
	(lire)	(dollars)	(lire)	(dollars)
Naphthol Yellow	49,000—65,000	1,904—3,095	40,000—65,000	2,000—3,250
Auramine	60,000—70,000	2,857—3,333	60,000—70,000	3,000—3,500
Orange II	20,000—22,000	952—1,047	20,000—22,000	1,000—1,100
Nigrosine, water soluble	28,000—35,000	1,333—1,666	28,000—35,000	1,400—1,750
Nigrosine, soluble in alcohol	30,000—38,000	1,428—1,809	30,000—38,000	1,500—1,900
Sulphur Black	7,000—11,000	333— 523	7,000—11,000	350— 550
Acid Black	27,000—30,000	1,285—1,428	24,000—28,000	1,200—1,400
Direct Black	27,000—33,000	1,285—1,571	24,000—30,000	1,200—1,500
Chrome Black	31,000—36,000	1,476—1,714	28,000—34,000	1,400—1,700
Methylene Blue	75,000—90,000	3,571—4,285	75,000—90,000	3,750—4,500
Direct Blue	23,000—27,000	1,095—1,285	22,000—26,000	1,100—1,300
Sulphur Blue	30,000—33,000	1,428—1,571	22,000—28,000	1,100—1,400
Malachite Green	75,000—90,000	3,571—4,285	75,000—90,000	3,750—4,500
Acid Green	60,000—70,000	2,857—3,333	60,000—70,000	3,000—3,500
Direct Green	35,000—50,000	1,666—2,380	30,000—36,000	1,500—1,800
Bismarck Brown	32,000—39,000	1,523—1,857	30,000—35,000	1,500—1,750
Magenta (Fuchsine) Crystals	70,000—80,000	3,333—3,809	70,000—80,000	3,500—4,000
Eosine	50,000—75,000	2,380—3,571	50,000—75,000	2,500—3,750
Ponceaux	27,000—32,000	1,285—1,523	25,000—30,000	1,250—1,500
Methyl Violet	65,000—80,000	3,095—3,809	65,000—80,000	3,250—4,000

TABLE II

	— February 10 —		—March 10—	
	(lire)	(dollars)	(lire)	(dollars)
Acetate of alumina	1,600	76	1,600	80
Chrome alum	3,500	166	3,500	175
Bichromate of potash	5,900	280	5,900	295
Ferrous sulphate	500	23	500	25
Copper sulphate	2,200	104	2,250	112
Tartar emetic	12,000	571	12,000	600
Aniline oil	13,500	642	13,500	675
White refined glycerine	8,800	419	8,000	400
Glucose, 45 deg. Be	3,900	185	3,900	195
Hydrogen peroxide	2,100	100	2,100	105
Tannic acid, 60 per cent	20,000	952	20,000	1,000
Tartaric, crystals	13,500	642	13,500	675
Acetic acid, 30 per cent	2,200	104	2,500	125
Formic acid	8,500	404	8,500	425
Hydrochloric acid, 20-21 deg. Be	250	11	250	12
Lactic acid, 80 per cent	6,000	285	6,000	300
Alum	850	40	850	42
Ammonia, 22 deg. Be	1,600	76	1,600	80
Bisulphite of soda, 32 deg. Be	380	18	380	19
Chlorate of potash	3,200	152	3,000	150
Chlorate of ammonia	3,000	142	3,000	150
Bleaching powder	900	42	900	45
Nitrite of soda	2,950	140	2,800	140
Yellow prussiate of potash	20,000	952	20,000	1,000
Yellow prussiate of soda	15,000	714	16,000	800
Caustic soda, 70/72	1,800	85	1,900	95
Silicate of soda, 140 deg. Tw	1,000	47	1,000	50
Sodium sulphite	2,500	119	2,750	137
Logwood extract	8,000	380	7,500	375
Yellow dextrine	3,500	166	3,100	155
White dextrine	3,000	142	3,150	157
Farina	2,300	109	2,450	122
Kordofan gum	8,000	380	8,000	400
Indigo, 25 per cent	22,000	1,047	22,000	1,100
Beta-naphthol	19,000	904	19,000	950
Industrial castor oil	6,000	285	5,600	280

made, at the time of writing, by the ministerial commission regarding the modifications to be effected in the importation tariffs.

In the meantime the very favorable balances of the cotton industry encouraged dyers in their production of colored goods for the coming seasons, and many of these anticipate a great increase in business if the French-German duel is not quickly settled.

Italy imported, during the first nine months of the past year, organic synthetic coloring matters to the extent of 1,081 tons, of which 975 tons came from Germany, 89½ tons from Switzerland and 16½ tons from other countries. Of such products, 85 tons were sulphur coloring matters, 879 tons dry colors and colors with less than 50 per cent of water and 117 tons colors in paste form with more than 50 per cent of water. During the same period Italy exported 17 tons of sulphur colors, 99 tons of dry colors and other colors with less than 50 per cent of water, and 2 tons of dyestuff pastes with more than 50 per cent of water.

The imports of dyewoods and tanning woods reached collectively 8,742 tons, of which 2,126 tons came from the United States, 434 tons from France, 5,592 tons from Argentina, and the rest from other countries. Of the above woods, 26½ tons were imported in a ground condition. The exports of dyewood extracts reached 263 tons.

By a decree of January 7, published during February, the following products are considered poisonous and are therefore prohibited for use in coloring soaps and toilet preparations: All artificial organic colors excepting Naphthol Yellow, Chrysoidine, Bordeaux B, Ponceau 2B,

Ponceau 2R, Victoria Scarlet Red, Erythrosine, Eosine, Phloxine, Aniline Blue, Acid Greens SOF, Malachite Green, Methyl Violet and Indigo Carmine; all natural organic colors excepting the colors of fruits and alimentary roots, the aluminum lakes obtained from these, Saffron, Curcuma, Chlorofil, Indigo, Cochineal, Carbon Black; all organic and inorganic colors containing arsenic, antimony, barium, cadmium, chrome, mercury, lead, copper, tin, zinc, uranium and derivatives of cyanogen.

The Demand for Colors

The demand for coloring matters continued very fair during the past six weeks, and this was not only for the war reparation products but also for imported colors, such as Naphthylamine Blacks, Chrome colors, Benzopurpurine 4B, Congo Red, Fast Direct Browns (Diamine Catechine, etc.), Diazo Black BH, Primulin, Chloramine Yellows, Sky Blues, Direct Grays, Direct Bordeaux, Carmoisine, Brilliant Fast Red, Chrysophenine, Tartrazine, Methyl Violet, Eerica BN and GN, Indigo and other vat colors, etc.

For the above reasons quite a large field was covered by the imports of colors, the war reparation products crowding out only a certain number of products. Of such conditions Switzerland seems, however, to have been foremost in taking the advantage. This country, in some cases, also sold products imported from Germany. Other countries seem to have essayed very little.

The demand was distributed principally over the cotton and wool dyeworks. A certain awakening was noted in the silk dyeworks, but the consumption of colors here did not, however, permit of very large business—in comparison, especially, with the works treating cotton or wool. To illustrate the importance of the business in Swiss colors, it will be sufficient to state that at Milan has been founded quite recently the new firm of "Sandoz" Colori di Anilina, Prodotti Chimici e Farmaceutici, for the production and commerce of aniline colors and products, with a capital of 100,000 lire divided over 100 shares of 1,000 lire, all arrangements being made until 1950.

Prices of Coal-Tar Dyes

The quotations for war reparation dyes in Table I, per ton in lire and dollars, show the great reductions which obtained, and changes effected in the dollar and lira prices at the moment of writing, in comparison with the prices prevailing on February 10 (the dyes being delivered in kegs from 25 to 50 kilos).

Mordants, Assistants, Dyehouse Products

Through the continuance of the French occupation of the Ruhr district, and the subsequent invasion of the Rhineland, the imports of French caustic soda dwindled to very little during the past five weeks; and Italian merchants and consumers who had preferred this product and that of national production to all others, owing to its greater cheapness and quicker delivery possibilities, found themselves quite unsupplied. As during the war, it was essayed to obtain additional supplies from the United States, England, Spain, Japan and other countries, paying what prices were demanded. For this reason the price of this extremely useful product rose strongly, and is still rising at the moment of writing. The product mostly demanded was of the strength 70/72. Besides the above product, there was a strong demand for sulphate of soda crystals, silicate of soda, carbonate of soda, sulphate of copper, etc. Most of the other products used in the dyeworks, because of accumulated stocks, reparation and otherwise, were not missing from the Italian market, and no change in price followed. Some other products, such as glycerine, hydrogen peroxide, chlorate of potash, nitrite of soda, Logwood extract, yellow dextrine, castor oil, etc., because of the small demand and the ample stocks available, fell in price. Some of the lira and dollar quotations are given, per ton at Milan, in Table II.

Private Dyehouse Quotations

Some private quotations for dyestuffs at Genoa were as follows per kilo, showing how these competed against the war reparation products: Direct Black, 28 to 33 lire; Nigrosine crystals, 26 to 30 lire; Chrome Black, in powder, 33 to 36 lire; Direct Green, 35 to 40 lire; Eosine, 51 to 57 lire; Orange II, 21 to 24 lire; Methylene Blue, 75 to 91 lire; liquid Fustic extract, 7.50 to 8 lire; Logwood extract, 7.50 to 7.80 lire; Hematite crystals, 11 to 12 lire.

Mineral Colors

The demand for mineral colors through the crisis in the shipbuilding industry, and consequently low requirements for paints, fell very strongly during the past six weeks, causing the marked fall in some of the prices indicated in Table III.

TABLE III

	February 10 (lire)	March 10 (lire)
Zinc white	400— 600	350— 600
Lead white	360— 400	400— 450
Chrome yellow	280—1,500	280—1,400
Zinc yellow	1,300—1,350	1,300—1,350
English red	100— 150	100— 150
Red oxide of iron	250— 300	150— 180
Brown oxide of iron	100— 150	90— 150
Iron minium	150— 250	140— 200
Cinabar	700—5,000	600—5,000
Lead minium	140— 380	140— 380
Red and yellow earths	60— 90	60— 90
Green earths	200— 250	200— 250
Paris blues	400—3,000	400—3,000
Ultramarine blues	500—1,200	500—1,200
Smoke black (lampblack)	450— 600	500— 550
Ivory black	300— 900	300— 900
Monaco lakes	3,000—3,500	3,000—3,500

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

LOUIS A. OLNEY
PROFESSOR OF CHEMISTRY AND DYEING, LOWELL TEXTILE SCHOOL
Directing Editor

LAURANCE T. CLARK
Managing Editor

Published biweekly by
HOWES PUBLISHING CO., INC.
4109 Woolworth Building, New York City

A. P. HOWES, *President* E. S. PREDMORE, *Secretary*

Subscription price $5.00 per year; Canadian $5.50; foreign $6.00

Vol. XII April 9, 1923 No. 8

COMMON SENSE CO-OPERATION AND THE DYE TARIFF

IN the last issue we had something to say in these columns of the fairly obvious attempt of the Textile Colorist to make the American dye manufacturer the scapegoat, the calculating flingere of wrenches into the machinery for administering paragraphs 27 and 28 of the Tariff Act of 1922. Judging from numerous responses received, we are led to believe our effort to show the utter absurdity of this view, and to point out that it would be against the manufacturers' own interests to follow such a course, was far from unsuccessful.

Yet the mere establishment of innocence is rather a negative result to attain, or even at best but half the battle. It is likewise possible to show that the manufacurers of dyestuffs are rendering valuable technical aid to the appraisers in their work of determining the status of dye imports seeking admission as non-competitive colors, and that this aid is of an intensely practical nature.

It will be remembered that the hullabaloo, charges, and counter-charges of obstruction grew out of the series of conferences between the appraisers, the manufacturers, the consumers, and the importers. One of the leading objects of these conferences became the preparation of a tentative list, for reference and guidance only, of foreign dyes in the competitive and non-competitive classes.

Elsewhere in this issue we print the agreed-upon list of non-competitive colors—the colors which may be admitted under the low duty rates. This list is not a permanent, ironclad thing. When it is above described as agreed-upon, what is meant is that it represents the nearest all parties could come to an agreement at the time of publication. There was not even a unanimous agreement that there should be any list published at all. Hence, in addition to being subject to change without notice, it is yet another degree removed from the bureaucrat's roseate dream of an ideal. For it carries with it, as an integral and vitally important part of its structure, the terse regulation that it "in no manner relieves appraising officers from the duty of independent appraisement required by law."

There is a world of meaning in that regulation. It means, for one thing, that anyone armed with it has just as much chance to protest a ruling, and to fight that ruling if he thinks fit, as would be the case if no list existed. In other words, he can go into court with an appeal against a decision of a Government official or group of officials, instead of an appeal to overthrow a law on the statute books. It means that, in a certain sense, the whole question of administering the tariff is thrown right back where it was when the controversy started—but it likewise means that a powerful weapon for preventing possible abuses or official mistakes is placed in the hands of all groups alike.

Theoretically, then, the list is without teeth. Practically, it should be found extremely useful, with none of the dangers which are ever inherent in a rigid, inflexible ruling. The mere existence of the list, for instance, coupled with the knowledge that, changeable though it may be, it represents the nearest a majority of the trade can come to an agreement, ought to have the effect of keeping down protests to a minimum and should exercise a wholesome restraint upon those who otherwise might systematically try to protest every decision in the hope of proving to the next Congress that the law creates bickering and strife.

Incidentally, we pause here long enough to say that the list is printed in The REPORTER as a matter of record, pure and simple, and that when changes occur they will be noted, also as a matter of record. There was a second list promulgated, a list of the competitive products, to which the identical regulation placing the decision in each case squarely upon the shoulders of the appraisers likewise applies, but since in a general way everything not included in the non-competitive list might reasonably be expected to appear in the competitive list, there would be little use in printing both.

The "responsibility" regulation applied to the non-competitive list, then, means that the appraisers must consider the case of each color importation individually and on its merits. This is something of a large order, and it happens to be an order which the appraiser's office is not equipped to fill in its entirety. There is a laboratory, but it is not capable of handling all classes of tests, particularly when asked to do so at the rate of twenty-five invoices a day.

Now in the case of products purporting to be non-competitive, there is no single group better fitted to assist in this work of testing than the synthetic organic chemical manufacturers themselves. The fact becomes

more apparent when it is remembered that, assuming a dishonest manufacturer and a dishonest consumer, and assuming that a claim of non-competitiveness has been disputed, the unscrupulous consumer conducting the tests may find competitive uses for the product but need not report them, whereas the equally unscrupulous manufacturer under similar circumstances is obliged to subject his findings, in order to enter a protest, to the scrutiny of consumers, appraisers, importers, and all. Crooked or straight, then, if a manufacturer finds evidence of competitiveness he can be depended upon to shout it from the housetops—with the advance knowledge that he will be expected to prove his claim to the complete satisfaction of the other groups. And on the contrary, if he declares it non-competitive, and hence not subject to the high duty charge, there is no likelihood that anyone else will care to dispute the statement.

Add to this powerful item of motive the equally important fact that within the ranks of the synthetic organic chemical manufacturers are to be found chemists whose entire training, abilities and experience have gone into making them specialists in conducting tests of this nature upon this particular class of products. Add also the fact that the Synthetic Organic Chemical Manufacturers Association of the United States has spent much time and money to equip a complete color classification and identification department, as well as to assemble, under the direction of H. F. Wilmot, technical adviser, a complete collection of samples of every dyestuff made here or abroad. Consider these facts, and the contention that the manufacturers are best fitted to assist the appraisers in deciding as to competitiveness becomes practically unassaibale.

So it is that now, when the appraiser's office finds itself with samples calling for tests beyond its power to conduct properly, or finds shipments coming too fast for the capacity of its own laboratory, some of the samples are sent to attorneys De Vries & Doherty, counsel for the Association and experts on tariff administration. These samples are then turned over to the Association's technical department for identification and classification, following which they are sent out to the laboratory of whatever firm seems peculiarly fitted to deal with them. To the appraiser, then, the receiving firm makes a full report, sometimes involving actual trial by application of the product, and this report is checked up in a number of ways by the appraiser's office, which is then prepared to render a decision.

As a result of this co-operation, it is stated that most of the inevitable snarls which developed shortly after the law went into effect are rapidly being straightened out, and tests which were in arrears are being cleaned up, with the practical certainty that as time goes on the operation of the law will be smooth enough and so eminently just as to satisfy all elements of the industry.

We have been at some pains to point out the situation as it exists to-day for the reason that it was desired to drive home clearly the fact that the charges heard here and there to the effect that dye manufacturers seek to hinder rather than aid the appraisers in applying the law, are ill founded to say the least; and that on the contrary, by reason of the very nature of their interests and personnel, the American dye manufacturers are furnishing co-operation of real value, both to Government and consumers.

Review of Recent Literature

"In the Cause of World Cleanliness." Oliver Trent. 56 pp.; 9x11½. A publication of the American Laundry Machinery Company. 1923.

Of all the trade publications issued by individual firms or organizations which have found their way into this office, the above volume, in beauty of make-up, excellence of literary style, and in the inevitable dignity imparted by a general treatment which, though modern in thought and aim, is almost classical in its simplicity, is surpassed by none; nor is it even approached by the great majority. And when we have all these virtues coupled with subject matter of real interest, the result is a masterpiece of trade publishing.

Such a work is "In the Cause of World Cleanliness," issued by the American Laundry Machinery Company in this country, and in Canada by the Canadian Laundry Machinery Company. That "cleanliness is next to godliness" is an age-old maxim, and "to give as simply as may be a picture of cleanliness at its very source" is the purpose of the book.

In a foreword the author states, "What is shown of the American Laundry Machinery Company and its plants, is incidental. To present something of the ideals and objectives of the laundry industry itself—this is our larger and worthier desire."

The aim is indeed well carried out. The birth of the industry is entertainingly and briefly described in the opening chapter. The service to-day rendered by power laundries, together with the gradual evolution of various power devices, are covered under the head of "Development"; some really staggering facts about the vast scale of operations of the company are presented in the section devoted to "Manufacture," while matters of real human interest are treated of in "Men," which tells of the conditions under which the employees of the company work and the incentives and provisions made for both physical and mental welfare.

No mention of this book should pass over the illustrations, which are really exceptional. Some are from

photographs and some are from drawings; they range in area from small decorations in text to full-page plates. But they are alike of an excellence, both as to original subject and as to reproduction, never met with outside of the products of high grade book publishers, and it is to be regretted that the artist was not recognized on the title page, along with the auhor.

As for the contribution of the latter toward he perfect whole, we have no hesitation in saying that this is a work in which every textile man, whether concerned with the power laundry industry or not, may find much of general interest.

"An Introduction to Theoretical and Applied Colloid Chemistry." By Dr. Wolfgang Ostwald; authorized translation from the eighth German edition by Dr. Marvin H. Fischer, Eichberg professor of physiology in the University of Cincinnati. Second and enlarged American edition; 266 pages, 6x9; illustrated; cloth; $2.50. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Ltd.; Montreal, Renouf Publishing Company.

This edition, which but recently came from the press, has been carefully revised, improved upon and enlarged. The volume itself is the literary result of a series of lectures delivered by the author (a professor of the University of Leipzig) several years ago in the United States and Canada. It is written in a singularly direct and lucid style and succeeds admirably in its attempt to present a general survey of that subject of so many as yet unrealized potentialities, modern colloid chemistry.

Primarily the subject is treated from the standpoint of a pure scientist, yet the practical application has by no means been overlooked, thereby doubling the value of the work to those who would speculate as to possibilities after having mastered fundamental theory. A list of the contents follows:

First lecture—Fundamental Properties of the Colloid State. Colloids as Examples of Dispersed Systems. Methods of Preparing Colloid Solutions; Second lecture—Classification of the Colloids. The Physico-Chemical Properties of the Colloids and Their Dependence Upon the Degree of Dispersion; third lecture—The Change in State of Colloids; fourth lecture—Some Scientific Applications of Colloid Chemistry, and fifth lecture—Some Technical Applications of Colloid Chemistry.

The Nelson Cotton Mills, Lenoir, N. C., is incorporated with a capital of $500,000, of which J. L. Nelson is president and treasurer and plans to erect a 6,000-spindle mill at Whitnel.

The American Cotton Fabric Corporation is organized with a capital stock of $7,500,000 to take over the Affiliated Cotton Mills.

Foreign Trade Opportunities

Reserved information may be obtained from the U. S. Bureau of Foreign and Domestic Commerce and its district and co-operative offices by duly registered firms and individuals upon written request by opportunity number. The bureau does not furnish credit rating or assume responsibility as to the standing of foreign inquirers; the usual precautions should be taken in all cases, and where no references are offered it does not necessarily imply that satisfactory references could not be given. Correspondence may be in English unless otherwise stated. Symbols: *Reported by American consular officers; †Reported by commercial attaches and trade commissioners; ‡Direct inquiries received by the Bureau.

5534.*—Undershirts, hats, belts, haberdashery, towels, *silk and cotton shawls*, fez caps, *cotton braids*, perfumes, umbrellas, pencils, iron safes, clocks and watches, caustic soda, soda ash, sulphuric acid, acetic acid, and oil lamps, all of the cheaper quality—Ceylon. Purchase and agency. Quotations, c. i. f. Ceylon port.

5545.*—Millinery, *silks* and *satins*, bridal goods, etc.—Ceylon. Purchase. Quotations, c. i. f. Ceylon port.

5560.*—*Hosiery, women's* fine and *heavy fleeced underwear* and *men's underwear*—Ireland. Agency. Quotations, c. i. f. Irish port.

5561.*—*Textiles*, hardware, groceries, food specialties, confectionery, chocolates, advertising novelties, calendars, etc.—South Africa. Agency.

5569.*—Canned fruits, meats, and fish; dried or evaporated fruits; paraffine scale for candles; rice; food specialties; and *artificial-silk goods* and *hosiery*—Ireland. Agency. Quotations, c. i. f. Irish port. Terms: Cash against documents.

5572.*—*Textiles* and *textile machinery*—France. Agency.

5331.†—*Sea-island colored cotton cord*—England. Purchase. Quotations, c. i. f. English port.

5340.‡—*Calicoes* and *madapolams* (bleached sheetings)—Egypt. Purchase. Samples and quotations desired. Correspondence, French.

5360.*—*Cloth for hammocks*, in quantity of 2,000 to 3,000 yards, in pieces of 50 yards each, in width of 1.5 to 1.6 meters; colors and designs should vary—Mexico. Purchase. A sample of the goods desired may be exam-

ined at the Bureau or its district offices. (Refer to file No. 81761.) Terms: Cash with order.

5361.*—*Cotton piece goods* — Sweden. Purchase. Quotations, c. i. f. Boras. Terms: Payment against documents.

5365.‡—*Cotton goods,* paper, foodstuffs, etc.—Malasia and Netherlands East Indies. Agency.

5369.†—Smallest economic unit of *worsted mules* for spinning, fingering, or knitting 4 or 5 ply yarns for Chinese carpets—China. Purchase. Quotations, c. i. f. Shanghai or Tientsin. Terms: One-third with order, one-third upon arrival, and remainder upon completion of plant.

5405.†—Chemicals, extracts, essences, *hosiery,* and dried fruits—Mexico. Agency and purchase. Quotations, f. o. b. New York. Payments to be made in New York or San Francisco.

5411.†—*Cottonades, denims,* and similar *textile goods* —South Africa. Agency.

5416.*—*Piece goods, hosiery,* undershirts, etc.—Ceylon. Agency. Quotations, c. i. f. Ceylon port.

5433.*—*Cotton hosiery* of ordinary to best quality, concrete bars and other kinds of building materials, aluminum ware, and linoleum—Greece. Agency. Quotations, c. i. f. Greek port. Correspondence, French.

5441.†—*Cotton piece goods,* especially prints, denims, and cottonades, *hosiery* and other lines; *silk and artificial-silk hosiery,* underwear, men's high-grade hats, and boots and shoes—South Africa. Agency.

5442.*—Foodstuffs, *dyes and colors,* paints, paper, mineral oils, and tires—Algeria. Purchase and agency. Steamship and coaling agency also desired. Quotations, c. i. f. Algerian port.

5451.*—*Textiles in general*—Canary Islands. Agency. Quotations, c. i. f. Las Palmas. Correspondence, Spanish or French.

5453.*—*Cotton and woolen piece goods, hosiery,* and haberdashery—India. Purchase. Quotations, c. i. f. port of India. Terms, cash against documents.

5457.†—*Cotton piece goods,* foodstuffs, chemicals, especially caustic soda and rosin, and all articles suitable to the Dutch East Indian markets—Netherlands. Agency.

5458.*—Upholstering materials, *woolen and cotton suitings* for men and women, *hosiery,* and underwear—Norway. Agency.

5461.*—*Hosiery* and underwear for men, women, and children—Ireland. Agency.

5462.*—*Silk piece goods,* particularly novelties; and *cotton novelty fabrics* of any original pattern or quality—Australia. Agency. Quotations, f. o. b. American port. Terms, cash in New York against documents.

5464.*—*Hosiery,* haberdashery, fancy goods, *piece goods,* etc.—India. Agency. Quotations, c. i. f. Indian port.

5465.‡—Musical instruments and musical novelties, toilet articles, *men's and women's hosiery,* and confectionery lines—South Africa. Agency.

5467.*—Shoes of all kinds of high and medium grades, for men and women; necktie; *cotton, silk, and woolen hosiery;* men's cheap clothing; raincoats; suspenders; *textiles;* and women's wearing apparel in general—South Africa. Exclusive agency. Quotations, f. o. b. American ports.

5471.*—*Fancy piece goods,* iron, aluminum, paints, colors, *hosiery,* and sundry lines—India. Agency. Quotations, c. i. f. Indian port.

5476.*—*Textiles and knit goods*—Chile. Agency. Correspondence, Spanish.

5486.†—*Textiles, hosiery,* and gloves — Australia. Agency. Quotations, c. i. f. Australian ports.

5488.*—*Textiles, hosiery,* alimentary articles, and small hardware—South Africa. Agency. Quotations, c. i. f. South African ports.

5493.*—Non-competing lines of general merchandise, including light hardware, *textiles,* industrial chemicals, drugs, and food products—Brazil. Agency from manufacturers.

5495.*—*Cotton yarn,* principally 2/50 and 2/60—Sweden. Purchase. Quotations, c. i. f. Goteborg. Terms, payment against documents.

4598*—Cotton waste, linters, and *raw cotton,* in quantity of 100,000 kilos of each—Germany. Purchase desired. Quotations, c. i. f. Hamburg or Bremen.

4599*—*Waterproof cotton duck, shirtings* of all kinds, *khaki, flannel,* etc., in all colors, leather-covered buckles, and enameled buckles, snap fasteners, and double-texture twill—Norway. Purchase desired. Quotations, c. i. f. Norwegian port.

4607†—*Machinery to equip a factory for the manuf c-*

ture of wooden bobbins for textile mills—France. Purchase desired.

4621*—*Medium grade cotton and artificial silk hosiery* for the tropics—Panama. Agency desired. Quotations, f. o. b. New York.

4622*—*Cotton goods,* especially gray sheeting, 3 to 4 yards to the pound—France. Agency desired.

4630*—*Artificial silk hosiery* of the best quality—England. Agency desired. Quotations, f. o. b. American port.

4669*—Cravats, collars, *shirts, socks, ribbons,* belts, *women's stockings, underwear, cotton goods,* and rice—Venezuela. Purchase or agencies desired. Quotations, c. i. f. Venezuelan port. Terms: Payment on receipt of goods. Correspondence, Spanish.

Recent Patents

Composition for Preserving Fabrics

U. S. 1,437,397. Havik Bruyn, Birmingham, Ala.

Claims are granted for the described covering for fabrics comprising the following ingredients in substantially the following proportions, to wit, four parts of boiled linseed oil, two parts of pulverized charcoal, and three parts of water having dissolved therein substantially all of the green fig soap which it will take up; and for the described method of compounding a flexible coating for exposed fabrics, which consists in providing three parts of water having dissolved therein green fig soap in the proportion of about one heaping tablespoonful to the quart of water, then adding the soapy water slowly to two parts of pulverized charcoal, and stirring same to form a paste, and then adding slowly to the paste four parts of boiled linseed oil and stirring same in.

Product for Dyeing and Printing Textile Materials and In General for Pigmentation of Various Substrata And Process for Manufacture of Same

U. S. 1,448,251. Marcel Bader and Charles Sunder, Alsatia, France, assignors of one-half to Durand & Huguenin, S. A., Basel, Switzerland.

Claims are granted for the described process for the manufacture of stable derivatives of vat dyestuffs in solid form, soluble in water and especially valuable for dyeing and printing purposes, consisting in transforming the corresponding leuco-compound of a vat dyestuff into a sulphuric acid ester and converting the said sulphuric acid ester into a sulphuric ester-salt.

A claim is granted for, as new products applicable for dyeing and printing textile materials and in general for pigmentation of various substrata, the described sulphuric ester-salts of leuco-derivatives of vat dyestuffs, which are soluble in water, show a great stability and give fast and uniform tints by their development on the substratum with the aid of a solution of an oxidizing agent.

Vat Dyestuff Derived from Anthraquinone and Process of Making Same

U. S. 1,436,770. Bertram Mayer, Wilhelm Moser, and Jakob Wurgler, Basel, Switzerland, assignors to Society of Chemical Industry in Basle, Basel, Switzerland.

As a new article of manufacture a claim is granted for the vat dyestuff resulting from the action of 2.3-diaminoanthroquinone on the product of condensation of beta-naphthoquinone-4-sulphonic acid with alpha-aminoanthraquinone and whose constitution is characterized by the presence of one anthraquinone-alpha-beta-naphthazine complex united by a $>N-H$ group to an anthraquinone nucleus, one of the valence of the nitrogen group $>N-H$ being fixed in a 4-position of the naphthalene nucleus of the anthraquinone-alpha-beta-naphthazine and the other in an alpha-position of the anthraquinone nucleus, the said dyestuff being in a dry state a red powder, soluble in sulphuric acid to a green solution and giving with caustic soda and hydrosulphite a brown-red vat by means of which cotton can be dyed Bordeaux tints.

Purification of Phenol-Contaminated Liquors

U. S. 1,437,395. Ralph L. Brown, Pittsburgh, Pa., assignor to the Koppers Company, Pittsburgh, Pa.

This describes the process of purifying phenol contaminated liquors, which consists in continuously passing the liquor at such dilution and rate of flow through a filter containing humous material holding phenol destroying micro organisms as to continuously maintain an approximate balance between the micro-organic wastage and the micro organic reproduction in the filter, substantially as described.

NEW BRUNSWICK CHEMICAL COMPANY INAUGURATES ADVERTISING CAMPAIGN

In order to bring its line of finishes and sizing assistants to the attention of the textile industry of the country, the New Brunswick Chemical Company, of Newark, N. J., has inaugurated an extensive publicity campaign which is being handled by the Hazard Advertising Corporation, of New York City.

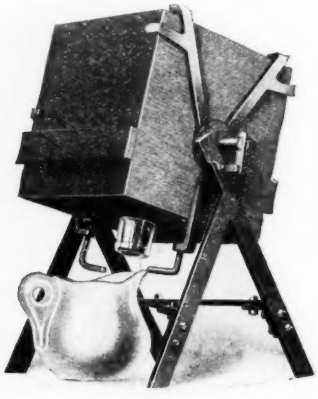
The products of the Company, which include an extensive line of special finishes as well as a product known as Terpol Hydrate—a material designed to convert ordinary pearl corn starch into a starch of thin boiling consistency—are the result of a close

study of the needs of the market for commodities of this type and have been produced only after painstaking research by the technical staff of the manufacturer.

Successive advertisements featuring products of the New Brunswick Chemical Company will appear regularly hereafter in the AMERICAN DYESTUFF REPORTER as well as other leading trade journals, and should prove of interest to all practical mill men who are desirous of keeping abreast of new developments in this line.

SAFETY CARBOY HOLDER PERMITS OF COMPLETE DRAINING WITH NO ATTENTION

Those familiar with the manipulation of carboys know that in the case of dangerous acids and other oil-like liquids, it takes 20 minutes at the very least to drain one of them completely. And they further know that this is not practicable, that no workman, even though he be "husky" enough, is willing to hold a carboy upside down for that length of time. Hence



there is a waste of from one to three pints out of every carboy "emptied."

All this has been done away with by the Safety Carboy Holder, a device occupying a floor space of but 23x26 inches, made of high grade steel, which grips the carboy immovably so that it can be locked bottom side up and left that way for an hour or a day. Further, the carboy can be brought into this position, and any intermediate stage for pouring, by a single turn of the wrist, thereby enabling a fifteen-year-old boy to draw the contents as accurately by the drop as by the gallon, and to do work heretofore demanding the efforts of two strong men.

An additional advantage—and a most important one—is that it eliminates all danger formerly associated with the handling of dangerous acids. There can be no slopping or wastage, and consequently no damage suits for burns and scalds such as frequently result from tipping a carboy over a block. When not in use, this device can also be locked in an upright position, thus preventing accidents to persons carelessly leaning against it.

The holder is made by the Safety Carboy Holder Company, 340 West Forty-second Street, New York, and is sold at a price allowing the smallest purchaser of carboys to own one. It is claimed that the purchase price can be saved in a very short time by its elimination of waste, and it is practically indestructible.

Its clamps and stand are adjustable to fit any size carboy, and can be put on, ready for use, in 60 seconds. It is guaranteed to carry 500 pounds with safety, and its shipping weight is 35 pounds.

S. R. DAVID COMPANY ELECTS OFFICERS AND DIRECTORS

At the fourth annual meeting of S. R. David & Co., Inc., which was held at their offices recently, the following officers were elected:

Sydney R. David, president and treasurer; Frank L. McCool, vice-president; E. T. David, assistant treasurer; M. M. Chamberlain, secretary and clerk.

Also the following directors were elected: Sydney R. David, Frank L. McCool, George H. Ashton, James B. Cook.

NOTES OF THE TRADE

The engagement of Francis J. Gutekunst, Jr., superintendent of the Wissonoming plant of the Helwig Silk Dyeing Company to Miss Rose Mulholland, of Philadelphia, was announced last week. It is understood that the wedding will take place in June.

The businesses, interests and properties of Emery & Beers Company, Inc., Paul Guenther, Inc., The Paul Guenther Knitting Company, and The Wharton Textile Company, all heretofore allied in the distribution and manufacture of "Onyx" hosiery, have been united in one corporation to be known as "Onyx" Hosiey, Inc. There will be no change in personnel, policy or management. The same men who created the "Onyx" brand and who have made it the best known hosiery in the world will continue to uphold its quality and spread its fame.

The Kaiser Wilhelm Institute for the advancement of Science, according to Consul E. Verne Richardson, Berlin, has recently added to the scheme of its activities an "Institute fur Faserstoffchemie" (textile fiber chemistry), which will devote its energies to investigating the possibilities for producing in Germany textile fibers suitable for use in cloth manufacture. Particular attention is to be paid to flax, the average annual yield of which has increased from a pre-war figure of about 4,000 metric tons to 17,000 metric tons during the war, and an estimated harvest of 25,000 metric tons in 1922. The yearly consumption of flax approximates 44,000 metric tons, necessitating considerable imports.

Some Practical Gasket Hints

By HENRY BOHMER, JR.

Flexitallic Gasket Company, Camden, N. J.

[Copyright, 1923, by Flexitallic Gasket Company, Camden, N. J. All rights reserved for use in a forthcoming book on gaskets.]

THE greatest difficulty I have encountered during my ten years of experience with gaskets has been to convince users that it is not necessary to tighten a thick flexible metallic gasket with the same extreme pressure as must be applied to thin non-flexible gaskets.

The idea seems to prevail that a gasket, in order to prevent leakage, must have as little thickness as possible and must be squeezed so thin that the distance between the faces of the flanges is a very close approach to absolute zero. Very often, when applying gaskets, we see the engineer or pipe fitter slip a pipe over the wrench, thereby incrasing the wrench's leverage and making it possible to still further increase the pressure against the gasket. As a result the gasket is squashed. If it is made of corrugated metallic material it is flattened out so flat that the corrugations can do no good whatever. It is poor practice to slip a pipe over *any* wrench on *any* gasket, because wrenches are generally made of a proper and safe length to fit the nut for which intended, and nut sizes are usually standardized to fit certain bolt diameters. This is a logical safety measure that has been almost universally adopted so that the bolt will not be subjected to too great tension. An extra long handled wrench, unless used with extreme care, is liable to either break the bolt or strip the threads.

One serious objection to the very thin gasket is that, no matter how it is constructed, it can have but little expanding or contracting capacity, consequently all expansion and contraction must be taken care of in some other manner—by means of pipe bends or expansion joints. A thicker gasket, having elastic properties, will naturally take care of considerable expansion and contraction. In many cases I have known thick flexible gaskets to take care of all of the expansion and contraction in the line—under ordinary temperature conditions of non-superheat practice.

Where temperatures are high, or where temperatures fluctuate considerably, copper, brass and other metallic gaskets having a coefficient of expansion different than that of the joint should not be used. On account of the difference in the coefficient the gasket and the joint tend to expand and contract independently of each other. The tightly bolted joint, being much stronger than the thin gasket, will compel the gasket to expand and contract along with it. Breakage and leakage of a serious nature are, therefore, often the result. A gasket made up of steel, which has the same coefficient of expansion as the joint, overcomes this latter trouble entirely, but if it is thin and non-flexible it does not overcome or assist in overcoming the longitudinal expansion troubles.

Hence, when applying thick flexible metallic gaskets be certain that a wrench of the correct length is used, and then tighten only enough so that the leakage is prevented. Do not tighten too tight. Any further tightening after leakage is stopped simply reduces the elasticity of the gasket and does not give it an opportunity to "breathe" as it should simultaneously with the expansion or contraction of the pipe line.

I therefore regard the matter of tightening as most important of all, and want to impress it upon all users of flexible metallic gaskets. By being as careful in tightening the gasket as one is when tightening an ordinary steam-engine stuffing box, or when taking up the wear in a bearing, the best results will be obtained. Take it easy. Don't strain muscles, wrenches, bolts, gaskets, or anything. If directions are always carefully followed much labor and fatigue will be avoided.

DU PONT ANNOUNCES FOUR NEW PRODUCTS

Pontamine Diazo Red 5BL, Sulfogene Direct Blue B Conc., Lithosol Orange R Base, and Lithosol Orange G Base are the four new products which E. I. du Pont de Nemours & Co. have announced placing on the market.

Pontamine Diazo Red 5BL is much bluer than Pontamine Diazo Scarlet A, and somewhat yellower than Pontamine Diazo Red 7BL. It has particularly good fastness to light, possesses good solubility, and dyes very evenly. As is the case with this series of colors, it also has good fastness to alkalies, washing, ironing, rubbing and organic acids, being suitable for dyeing loose cotton and yarn intended for manufacture of fancy woven goods, as well as for knitting and sewing yarns. The fact that it is affected only slightly by metals renders it suitable for dyeing in machines. On silk it produces reds of good fastness to water and washing. On half silk the silk is dyed weaker than the cotton. The product may be discharged with sulphoxylates.

Sulfogene Direct Blue B Conc. is a dyestuff that represents a development in domestic manufacture of a blue that does not require oxidizing after dyeing. A product that does not require the oxidization should be very well received by the users of dyestuffs who demand a Sulphur Blue. Sulfogene Direct Blue B Conc. of the Du Pont company shows a very good fastness to cross-dyeing, becoming only slightly redder. It can be used for dyeing warps, and the resulting shades are fast to milling and washing. The color is readily soluble, dyes evenly, and is therefore suitable for machine dyeing. It yields full shades on artificial silk, and also may be applied to pure silk. After-treatment with formaldehyde changes the shades only slightly.

Lithosol Orange R Base and Lithosol Orange G Base are two new lake bases which, when coupled with beta-naphthol, give toners of brilliant orange shades.

The American Chemical Products Company, 315 New Street, Newark, N. J., has filed notice of organization and will manufacture chemicals, dyes and allied products. William O'Conner heads the concern.

Beam Dyeing

Advantages of Modern Methods—Suitable Handling Equipment Necessary—Watch the Warpers—Dry the Warps Before Slashing—The Dyeing Operation—Importance of the Human Equation—Direct, Sulphur, Developed, and Vat Colors—Bleaching

By H. JALA

INDUSTRIAL development brings, inevitably, new processes. Old ideas give way to new, old methods are superseded by others more accurate, more efficient. In no industry has this been more evident within the last few years than in dyeing.

Formerly, when the colors available were but crude extracts of vegetable or animal, or occasionally some mineral, matter, of doubtful composition and dyeing property, the open-vat method was the only practical one. The material to be dyed was steeped in an open tub where it could be watched and worked continually until it had absorbed the required amount of color, when it was taken out. With the advent of scientifically constructed synthetic dyestuffs of level dyeing properties and uniform tinctorial strength, a change of method became possible which has, in the last few years, developed into what may, in a general way, be called package dyeing.

Package dyeing differs from the old method in that the material to be dyed, instead of being passed through the liquor, is held stationary while the liquor is pumped through it. It is questionable whether this method will ever be satisfactory for piece dyeing, but it has been in successful operation for a number of years with raw stock and is rapidly gaining in popularity for yarn dyeing. A number of machines have been placed on the market for accomplishing this work, all of which use the same method of operation and vary principally in the size of the package handled. The yarn in every case is wound on some form of tube which is of sufficiently open construction to allow the passage of the dye liquor, and is then placed in the machine which pumps the liquor through it, first one way and then the other, until a proper dyeing is obtained.

The advantages over the old method are obvious. It is possible to use a smaller proportion of dye liquor. This means less dye and a more complete exhaustion of the bath, resulting in a marked economy where high-priced dyes are used. The yarn, being in a more compact and easily manipulated form, is less liable to damage. It is simply placed in the machine, dyed and taken out. Contrast this with the long-chain system where the warp must be wrapped with a cord to prevent tangling and is then repeatedly passed through a series of rollers, where it is sometimes very nearly worn out before it is dyed, dried and delivered to the beaming room.

For the ordinary colored goods mill the package method that appears the most efficient is the dyeing on the beam itself after the yarn has been warped. It is applicable not only to yarn that is to be woven into cloth, but also to yarn that is afterward to be quilled or twisted, and presents the desirable qualities of a maximum package with a minimum of handling and waste. With a beam dyeing equipment there is practically no difference in the handling of the yarn between a white mill and a colored goods mill, except that in the colored mill the yarn makes a few hours' pause in the dyehouse between the warper and the slasher. The saving in time alone of such an arrangement can best be appreciated by those who know what it is to fret all patience away while waiting for rush patterns to get through the beaming room. The financial saving in the complete elimination of the beaming room is left to the calculation of those who have one to contend with.

For mills contemplating the installation of a beam dyeing outfit, however, there are a number of matters which should receive careful consideration, chief among which is the quality of the water supply. This is always an important point in dyehouse work, but becomes especially so where the water is to be pumped through the beam. The closely wound yarn makes a first-class filter which will strain out any calcium or magnesium salts which may have been thrown out by the soda ash in the bath, suspended vegetable matter or just plain mud. These deposits will form a scum over the yarn on the outside or the inside of the beam and will not only foul the color in those places but will actually interfere with the circulation of the liquor to such an extent as to make uniform dyeing impossible. Very hard or dirty water, therefore, is, on the whole, impracticable, although either defect can be corrected with a satisfactory filtering system, and the precipitation of sediment in the machine can be avoided, to a certain extent, by the substitution of Turkey red oil for soda ash in the boil. Even with the best of water and care, the wire beam barrel, after repeated dyeing, will become clogged with an accumulation of lint and trash which has to be boiled off every so often.

Suitable Handling Equipment Necessary

Provision must also be made for the proper handling of the beams. The beam barrel, being made hollow for the passage of the dye liquor, is larger than ordi-

nary. This makes a large, unwieldly beam which when filled with yarn will weigh in the wet condition up to a thousand pounds, and it is not possible to handle it without occasional injury to the yarn or the beam heads unless adequate equipment is at hand. An overhead track is preferable, but if this cannot be had and the beams must be rolled about on trucks there should be chain hoists placed for lifting them off the trucks to the floor, and vice versa, and for placing them in the dye machine or slasher creels. An ideal arrangement is one that connects the warper room with the dyehouse so that the beams can be doffed off the warpers and carried to the dyehouse, and either placed in the dye machine or on the floor without any intermediate handling.

Money spent in this direction is well invested. Careless or rough handling in this case means bent or broken beam heads, and that inevitably means that on the warper the selvage cannot be run as close to the beam head as is necessary. On ordinary work a bad selvage gives trouble enough, but when it is remembered that in beam dyeing the liquor will always go through a soft place in the beam in preference to the more closely wound portion it is easy to see that a soft ended beam is fatal to good work.

Watch the Warpers

Successful beam dyeing calls for practically perfect work on the warpers. When the liquor is circulated through the yarn it must circulate evenly to produce even work. This means that the yarn must fill the beam from one head to the other with equal density at every point, and also fit snugly against the beam head to prevent undue leakage of liquor at that place. Warper combs must be kept in perfect condition, and some form of positive expansion comb must be used so that the threads will be spaced evenly. With the best of care a spring comb will eventually give way so that the yarn will be spaced more openly toward the ends than in the center; and while this defect may be so slight as to be imperceptible, it will make a beam that will be hard in the middle and soft at the ends. When dyed, the circulation will be good through the loosely wound yarn and poor where it is tighter, with the result that ends will be well dyed, with light or altogether undyed streaks in the middle. Furthermore, bent or broken teeth or any other irregularity in the spacing of the comb will produce high or low places on the beam which will show up in the dyeing as light streaks or channeled places.

On the whole, it will be found desirable to make a rather loosely wound beam, as this allows a free passage of liquor. This can be accomplished by running as light a weight on the drop roll as is possible without letting the yarn kink, and running the beam over instead of under—that is, having the top of the beam turn toward the operator, as this puts less strain on the yarn. While it may be found somewhat irksome at first to get the desired quality of work from the warpers, the benefit derived from the improvement in the running of the work on the slashers alone will make it worth while.

Dry the Warps Before Slashing

It will also be found necessary for the best results to install dry cans behind the slashers to dry the yarn thoroughly before it goes into the size box. While the beams are pretty well rid of water in the dye tub, they are not dried completely and the only way this can be done is over dry cans. An old slasher cylinder will do if one is handy, but it is best to get a set of dry cans built for the purpose. The set consists of two cans, which are placed between the creel and the size box. In this way the yarn is dried to a uniform degree before going into the size. This arrangement is not absolutely necessary except where a good finish is required. It is quite possible to size the damp yarn so that it will weave fairly well, but as the water cannot be uniformly extracted in the dye tub it will vary the amount of size taken up, with a consequent variation of finish.

The Dyeing Operation

For the operation of the beam dyeing machine it will be found advisable to select a careful man who is already familiar with the handling of the various classes of colors. While the machine itself is not complicated nor the operation difficult to learn, the personal element enters into beam dyeing to a considerable degree. The machine consists primarily of a tub into which the beam is placed, and a pump to circulate the liquor. The discharge pipe of the pump passes through the end of the tub, terminating in a gland to which one end of the beam is clamped and with which it is revolved slowly during the dyeing. This turning-over motion contributes to the evenness of the dyeing. These is also a large tank used as a storage tank for standing baths and a smaller circulation tank into which the dye and chemicals are fed during the dyeing process.

A beam being placed in position ready for dyeing, the tub is filled with water until the beam is covered and the water heated by steam pipes in the bottom of the tub. The pump is then started and the water is forced into the barrel of the beam through the end which is bolted to the gland. As the other beam head is solid, the water must, perforce, go through the yarn, and this is done at a pressure which does not go over 10 pounds per square inch when conditions are right. After going through the yarn, the water passes out of the tub, through a drain pipe which takes it to the circulation tank from which it is drawn again to the pump, and a circulation is thus continued from the inside to the outside of the beam. After the chemicals

for the boil-out or the dyeing have been introduced into the circulation tank and run for a certain length of time, a lid is let down on the tub and bolted tightly into position. By a change of valves the circulation is then reversed. The liquor, passing into the bottom of the tub, is forced through the yarn and finds its way through the beam barrel to the circulation tank and back to the pump again, a circulation being thus maintained from outside to inside. These processes are reversed for various lengths of time until the dyeing has been completed.

After washing, the yarn is freed of excess water by the use of compressed air. Some centrifugal wringing system whereby the beam could be whizzed like the basket of a hydro-extractor would probably be more efficient, and machines for this purpose have been built. There are a number or colors, however, such as indigo, which must be oxidized during the dyeing process, and it is a very satisfactory arrangement for the air to serve the double purpose of oxidizing the color and blowing out the liquor at the same time.

The Human Equation Important

The final success of the operation depends to a great extent on the man in charge of the machine, for the reason that no two colors behave alike and the different periods of circulation are never equal but must be determined by experiment. The reason for this is probably the difference in the amount of yarn exposed on the inside of the beam as compared with the outside surface. In other words, the bore of the beam is never as large as its outside circumference and the circulation from outside to inside is almost always longer than the reverse. A skillful operator, by releasing the pressure to a certain extent back into the circulation tank and by other careful handling, can often make a successful dyeing of a beam which a less experienced or less careful man would either channel with excessive pressure or dye unevenly with a faulty circulation. While this sort of trouble does not occur to any great extent after the warper-room help have been trained properly, still imperfect work will occasionally slip through, as everyone knows, and in a case where a streaky beam will spoil several thousand yards of cloth the man who can save the situation when it does come up is valuable.

Like every good thing, beam dyeing has its defects. To a dyer who is used to the chain system, the most evident fault is the impossibility of telling to what extent the beam is dyed on the inside. Nor is there any way to remedy this except, possibly, to put a swatch of yarn inside the beam barrel. Even this would not be satisfactory, because the beam would have to be taken out of the machine before the swatch could be examined, and even if the outside and the inside of the beam were of the right shade the middle might be off and there would be no way to tell it until it was run off on the slasher. This is a defect for which there is no remedy, but which gives no trouble when the machine is properly handled. Beams can be dyed evenly and colors matched satisfactorily by a competent operator.

Another trouble which will show up when the machine is first put in is that beam dyed warps are almost always duller in shade than those dyed in the chain. Just why this should be so is not positively known, but the fact remains that with the same dye the chain method will give a much brighter color. However, this is not an insurmountable difficulty. Beam dyeing is no new thing and dye companies are fully acquainted with its peculiarities. They are always ready to lend their advice or assistance in finding ways to brighten up old colors or in substituting new ones of the required brilliance.

The third and probably most serious defect of the single-beam machine shows up in the making of chambray or solid color patterns, and to a certain extent wide checks or stripes. There are machines with a capacity of five or six beams in which enough beams for a set can be dyed at one operation and the same shade obtained on all of them, but with a single-beam machine it is a very difficult matter. Practical dyers know that however exactly dyes are weighed out, or however carefully the operation is performed, variations will occur between batches. Whether due to dye, cotton or operator, they are there and must be taken into consideration in the run of the work. For this reason, while it is being done on lower grades of chambray, it is not advisable on a high grade of solid patterns or wide stripes to attempt to match up a set of four to six beams, supposedly of the same shade, all of which have been dyed separately. Small stripes or checks will deceive the eye, but as the stripes get wider variations between threads become more perceptible, and one beam a trifle off shade will produce a stripe within a stripe—an effect which cannot be said to be regarded with favor by the trade at the present time.

(*To be concluded.*)

A new artificial silk mill, with a capital of 15,000,000 francs, is being formed in Lyons, for the manufacture of artificial silk by the viscose process. The promoters of this enterprise include many well-known textile manufacturers.

In spite of the general depression prevailing in South Africa throughout 1922, the imports of silk hosiery for the eight months ended August amounted to £145,153. It is estimated that the total for 1922 will be over £250,000. The United States, the United Kingdom, and Japan share the bulk of the trade, in the order mentioned.

A. C. S. DIVISION ABSTRACTS

(*Concluded from page 276.*)

A Method for the Determination of Tolidine

By Samuel Palkin

The determination of tolidine by the usual nitrite titration leaves much to be desired in the way of definiteness of end point and accuracy of titration.

The method described in this paper depends upon the facts that the dihydrochloride of tolidine can be precipitated completely from an aqueous acid solution by the addition of saturated salt solution and then titrated acidimetrically using a suitable indicator.

Tables are given showing determinations made under varying conditions of salt and acid concentration.

The Effect of Hydrogen-Ion Concentration on the Adsorption of Dyes by Alumina, Silica and Wood

By O. Reinmuth and Neil E. Gordon

A study of adsorption of dyes was taken up paying special attention to the hydrogen-ion concentration. As the PH value decreased the adsorption of such dyes as Orange II by Alumina was increased while there was slight variation in the case of silica. Wool was mordanted with the gels, and it was found that the color of the dye in the wool was a very distinct function of the hydrogen-ion concentration.

Mercury Arc Lamps in Dye Testing

Anomalous Effects of the Mercury Arc Explained—Oxidation vs. Reduction Fading—Reversals in Relative Fastness of Direct and Basic Colors—Method of Tempering Light from the Mercury Arc to Give the Effect of Sunlight—Uses of the Untempered Arc

By OSCAR R. FLYNN

Waldrich Bleachery

THE effect of light on coloring matter, bringing about its alteration or destruction, like other photo-chemical effects, is very little understood; and for this reason the testing of dyes for light fastness is largely in the empirical stage.

For a long time the chief difficulty in the way both of the scientific study of light effects as well as the practical testing of dyes for light fastness, has been the lack of a suitable source of radiant energy; but this difficulty has been largely overcome by the discovery of the mercury vapor arc and by the improvements in the technique of working with fused quartz, which has made it practicable to house the arc within walls which permit its radiant energy to escape.

The intervention of the World War put a stop to many lines of scientific investigation not of immediate application and among other things turned the attention of the dye chemist toward the chemistry of dye construction rather than dye destruction. Just at present there seems to be a revival of interest in those problems which concern the fastness of dyes, and especially in problems of light fastness. This would, of course, make it timely to take up again the question of the fitness of the mercury arc for dye testing.

Mercury Arc Light

The mercury arc is peculiar in that such a large proportion of the radiant energy generated by the resistance of the mercury vapor to the passage of the mercury vapor to the passage of the current is of the short wave rapid vibration kind to which the eye has not been attuned, and which is therefore invisible light. Being more refrangible than the visible violet rays, its spectrum falls beyond the spectrum of the violet where its presence is made known by photography and by its fluorescent effects on a screen coated with anthracene or other fluorescent substance. Because of its position in the spectrum we have the name ultra-violet.

This kind of radiation (the ultra-violet) is especially active in bringing about chemical change. It is the presence of a small proportion in sunlight which is responsible for most of the chemical effects of the sun such as sunburn, bleaching of linen, and the fading of dyes. The presence of a much larger proportion in the mercury light makes it more powerful in the production of all these effects.

Owing to the fact that calcium and lead absorb ultra-violet radiation, especially the shortest waves which are the most active chemically, the mercury arc enclosed in glass does not exhibit its most powerful chemical effects and it is only when the arc operates within a transparent chamber of purest quartz that these actinic rays stream forth in fullest intensity and become fully available for the production of fading and other chemical effects.

Use in Dye Testing

Various investigators have experimented with the quartz tube mercury light and have noted its destructive effects on many compounds, including the colored organic substances used as dyes, and it has generally been concluded that the fading energy from this source was not only stronger than sunlight but intrinsically different

in its effect. In spite of this conclusion its quick action and ready availability has caused it to be extensively used in dye testing, each user making such allowance and corrections as his experience with his own line of work has shown to be necessary.

In my own work with dyed cotton fabrics at the Waldrich Bleachery, I made it a practice to expose to the mercury light samples of every dyeing made in the regular course of work. The dyeings were pasted on sheets of paper in narrow strips, about twenty to the sheet, and exposed usually for half an hour in such a way as to bring one-third of each strip under the action of the light. The sheets were then exposed to sunlight in such a way that another third of each strip was acted upon by sunlight, the time of the sunlight exposure being regulated by the behavior of a standard dyeing of Scarlet 8BS placed with each set of dyeings. The sunlight exposure was continued until this standard showed the same degree of sunlight fading as of mercury light fading. In other words, the exposure to sunlight was allowed to go on until balanced fading had been registered on the standard selected.

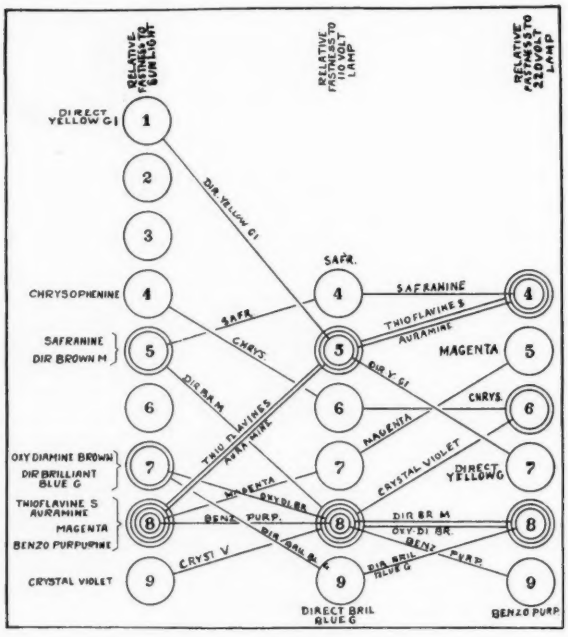


FIG. 1—*Effect Produced on Relative Fastness of Direct and Basic Colors by Increase in Intensity of Fading Light. Interpretation of Harrison's Results.*

PECULIARITIES IN FADING

By a study of these sheets I was able to pick out a number of examples of departure from the norm of balanced fading in one direction or the other. I noticed that basic dyes on antimony tanned cotton were faded much more heavily by the sun than by the mercury light and that many of the so-called light fast cotton dyes, the L brands, were out of balance in the opposite sense.

It was also noticeable that exposure to the strong mercury light produced effects which were not seen at all in the sun fadings. For example, chrysophenine and chloramine yellow were darkened and Indanthrene Yellow G assumed a distinctly greenish tone. Some of the light fast cotton colors exhibited a change in shade toward the purple. This was distinctly the case with Solamine Red 8BL. These abnormal changes in tone disappeared, however, after the dyeings had rested for a sufficient time in the dark, and whatever fading could then be noticed would not be distinguished from sunlight fading.

SELECTIVE RADIATION

In attempting to find a reasonable explanation for these peculiarities, both of unduly rapid or retarded fading as well as abnormal changes in color, I encountered the term "selective radiation." A hot solid usually gives off a continuous mass of radiation, the amplitude of the waves gradually decreasing as they become shorter. As the temperature is increased additional and finer waves are continually being added to the mass. A heated gas, however, dissipates its energy in certain selected wave lengths. The spectrum of the hot solid is continuous, decreasing in intensity toward the violet, while the spectrum of the hot gas is discontinuous, appearing as a number of bright lines in different parts of the spectrum.

This selective radiation of gases extends beyond the visible part of the spectrum into the ultra-violet. Now it has been argued that the peculiar effects observed in dyes exposed to the radiations from hot mercury vapor result from selective absorption of the selective radiation which it gives off, especially the ultra-violet part.

To make clear just what is involved in this explanation we may make use of an illustration drawn from the theory of sound. The waves given off by a musical instrument such as an organ pipe are distinctly selective in character, consisting of waves corresponding to the pitch and a certain number of overtones. Such an organ pipe produces a sound spectrum which corresponds to the spectrum from a hot gas.

Now let us represent the dye molecule by a tuning fork to which we will imagine certain pith balls have been lightly fastened to produce an aggregation which is capable of being broken up. When the organ pipe sounds the tuning fork will be disturbed or not according to whether the pitch of the fork corresponds to the pitch of the pipe or its overtones. If it does correspond to one of the more powerful waves it will be set in strong sympathetic vibration and the pith balls will be thrown off, symbolizing in this way the decomposition of the dye molecule by selective absorption of selective radiation.

Now let us imagine a sound possibly equal or greater in energy to emanate from, let us suppose, a small waterfall. This continuous roar will correspond to the spectrum of the hot solid and will, of course, contain waves which synchronize with the tuning fork, but as they rep-

resent such a small part of the total energy the resulting effect will be much less than that produced by the organ pipe and the pith balls will not be so quickly thrown off; they may in fact not be thrown off at all.

Effect of Fiber

The obvious fallacy of the selective radiation theory is in supposing that the fading effect is primarily a decomposing action of the light upon the dye and ignoring the fact that the substances in contact with the dye have more effect in determining the fastness of the dye to light than has the kind of light.

It has long been known that the so-called direct cotton dyes are in many cases much faster when dyed upon wool than when dyed upon cotton. Even Congo red, which represents one of the lowest degrees of fastness as a cotton dye, is quite a fast color when dyed upon wool. Also it has been known for a long time that many dyes which fade quite easily in the air do not fade in vacuum.

The best working theory of fading as applied to colors dyed upon cotton appears in a paper published in the "Journal of the Society of Colourists and Dyers," July, 1912, by William Harrison. The title of this contribution is "The Action of Light on Colouring Matter." It is a paper well worth reading in its entirety.

Harrison had observed just as others before him had done, that the quartz tube mercury light produced effects which differed from those of sunlight not only in quickness as a whole but in relative quickness as well. He found in other words that fastness tests made with the mercury lamp gave different results from those obtained by sunlight exposures.

Harrison's Experiment

He made, however, this additional discovery, namely, that the departure from normal sunlight fading increased as the speed with which the fading took place was increased, or in other words, that there was an inverse relationship between quickness of fading and normality of fading.

In order to throw light on this inverse relationship, he carried out a number of experiments which tended to show that the fading produced by light was the result of at least two actions more or less antagonistic, that is, the oxidizing action of the air and the reducing effect of the fiber. His experiments also tended to show that the reducing effect was accelerated much more than the oxidizing effect by an increase in the intensity of the fading energy.

He investigated the action of mercury light alone on a representative selection of dyes by exposing them in evacuated and sealed quartz tubes to the light, the dyes being filmed on glass for this purpose instead of being dyed on the usual fiber of cotton, silk or wool.

As a result of this experiment he was able to reaffirm what has long been generally believed by close students of the subject, namely, that dyes do not fade in the absence of air or of fiber. Absorption of light by the dye, selective or otherwise, certainly has little if any influence in fading; that is, fading is a chemical reaction and not merely a chemical decomposition.

The same collection of dyes filmed on glass as before gave a different set of results when exposed to the mercury light in the presence of air. Especially it should be noted that the two direct cotton colors used, colors which would ordinarily be classed as fugitive, did not fade, revealing the fact that oxidization was the cause of the fading of the latter, while the fading of the direct colors as we ordinarily encounter it must be due to some other cause.

Direct colors when dyed on cotton in the usual way and exposed to strong mercury light in the absence of oxygen, the access of the ultra-violet rays and the exclusion of

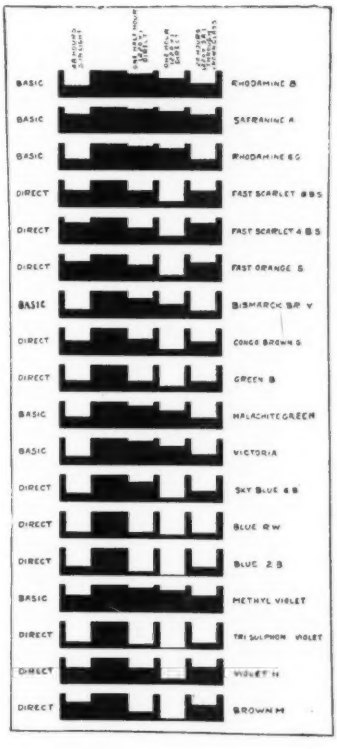


Fig. 2—*Equalization in Rates of Fading Brought About by Tempering of Mercury Radiation with Crown Glass; Relative Fading Shown by Depth of "Cut." Original Results.*

air being secured as before by sealing in quartz, were found to fade. That this fading was caused by reduction was made evident by the discovery that the cotton itself had been oxidized where it had been in contact with the faded dye.

A well-known vat color which turns blue on reduction was also found to be affected by cotton under the influ-

ence of the mercury light and in the absence of air, and to reveal by its change in color that the action was a reducing one. The dye in question, indanthrene yellow (the same dye already referred to) was found to turn green when acted upon by the light, the green color disappearing when the tube was opened and the air readmitted.

Although basic colors are capable of forming leuco dyes by reduction and, although these leuco dyes are more or less colorless, it could not be discovered that crystal violet underwent any change when exposed on cotton and in the absence of the air to the strong mercury light. It should be noted, however, that the crystal violet was not directly in contact with the cotton as it had been dyed in the usual way on a tannin mordant.

Light Intensity

Harrison also carried out some experiments which tend to show that the reducing action of light is proportional to the intensity. He found, for example, that the greenish color developed in the indanthrene yellow on cotton was greater under the action of the 220-volt arc than under the 110-volt arc, a condition of equilibrium seeming to result. In the presence of air there was no noticeable effect produced by the 110-volt arc, due as he explains to the fact that the air reoxidized the blue reduction compound as fast as it was formed; but in the case of the 220-volt arc the reduction was too rapid for the air to counteract its effect so some greenish color developed.

A similar result was obtained with methylene blue, which in this case, and unlike the crystal violet, was dyed directly on the cotton, if we can properly call cotton stained with methylene blue dyed.

Methylene blue so dyed or stained upon cotton was found to fade slowly in sunlight and more rapidly under the 110-volt arc, but there was no evidence of the formation of leuco dye; the fading was evidently by oxidation just as in the case of the dye exposed on glass. However, when the 220-volt arc was put into action there was unmistakable evidence that the fading was at least partly reduction. It was found that the faded portion contained some leuco methylene blue which could be made to show itself quickly by wetting the faded spots with ammonia water which stimulated the reoxidation.

Direct cotton dyes curiously enough were found not to be affected by even prolonged exposure to sunlight on cotton in the absence of air. This exposure was carried out in evacuated tubes, which were in this case of glass, but that fact would have little bearing on the subject, as we know that under ordinary circumstances and in the presence of air, these same dyes fade quite readily in sunlight, even though it is filtered through glass.

He found, however, that a preliminary treatment of the cotton with acids or with oxidizing agents brought it into a condition so that direct dyes would fade when dyed upon the cotton so modified and then exposed to sunlight in the absence of air. From these results he concludes that the fading of direct colors under ordinary circumstances, that is, in sunlight or under fading light of about the same intensity, is due not directly to the reducing action of the cellulose but due rather to the action of the cellulose which has been modified by the oxidizing action of the air under the action of the light; in other words, due to the action of oxycellulose.

This in itself is not a far-fetched conclusion, as it is quite certain that cellulose does become converted into oxycellulose by the action of air stimulated by sunlight, and furthermore cellulose once oxidized becomes prone to still more oxidation; that is, oxycellulose is a much better reducing agent than unmodified cellulose. To sum up, then, some of the main conclusions of Harrison's article we have the following:

Direct colors containing an azo linking *fade* under strong light in the absence of oxygen through the reducing action of cellulose; under weak light, in the presence of oxygen by the reducing action of oxycellulose. Colors which do not contain azo linkings and which cannot be destroyed by reduction fade by oxidation.

Reversal of Relative Fastness

The influence of the two kinds of fading; namely, fading by oxidation and fading by reduction, in causing a reversal of the relative fastness of direct and basic colors when tested by strong mercury light, is shown in the chart at *Fig.* 1. This chart embodies the results in one of Harrison's tables.

The results of the action of three kinds of light on nine colors dyed on cotton is shown. Six of these are direct colors and three of them are basic, but the result is the more striking because of the behavior of one of the direct colors which happens to be one of those yellows related to primuline, which cannot be destroyed by reduction and which is here seen to line up with the basic colors not destroyed by reduction. The dye in question is Thioflavine S.

The exposure to sunlight, 110-volt mercury light, and 220-volt mercury light were continued in each case until benzo purpurine was faded to practically the same degree under all three lights, as shown by the fact that the benzo purpurine line is nearly straight. This was not intentional, however, on the part of the experimenter and had any dye been deliberately chosen to furnish a standard of comparison it would have been better to have selected one of the basic dyes and to have timed the exposures so that this basic dye showed the same fading under all three lights, as the basic dye probably fades more nearly in direct proportion to the strength of the fading light than do direct azo colors like benzo purpurine.

Nevertheless, taking the results just as they are given it is quite easy to see that there is a general parallelism between the lines representing the behavior of the direct azo colors which are destroyed by reduction, and a similar parallelism between the ones corresponding to the basic and the non-azo direct colors, which are the ones not

capable of being destroyed by reduction and represent the type which fades by oxidation.

A conspicuous example of reversal of relative fastness as between the reducible and non-reducible types of fading is seen first in the case of the three yellow dyes, which exhibit a fastness of five under the 110-volt light. The direct azo yellow, which is very much faster than the basic auramine and the direct dyeing non-azo Thioflavine S under sunlight, shows relatively fugitive compared with two colors when tested under the 220-volt lamp. A similar relationship is also observed between oxydiamine brown, brown M, and benzo purpurine, three direct dyeing azo colors on the one hand, and the basic dye crystal violet on the other. Although the differences in fastness shown under sunlight and under the 220-volt light are not so great as in the case of the yellows, the reversal is just as evident.

This reversal of the relative rates of fading as between the dyes which come under the classification of dyes fading by reduction and those fading by oxidation, suggested very strongly that in comparing dyes belonging to these two classes it will be necessary to cut down any strong artificial fading light to an intensity comparable with sunlight, either by lessening the voltage, increasing the distance, or by interposing transparent filters of glass capable of absorbing some of the ultra-violet light.

Tempering Mercury Arc Light

It was decided to make the first tests with screens of thin crown glass of different thicknesses. In preparation for the tests a large number of swatches dyed with representative direct and basic colors were exposed at the same time, so as to register the same intensity and amount of sun fading on a small part of each swatch, the rest being carefully covered from the action of the sun. The exposures were made from 9 a. m. to 3 p. m. on clear days only, and at the end of forty-eight hours of sun exposure, a sufficient number of the colors registered a degree of fading which warranted going on to the next step. This consisted first in cutting off strips showing some of the faded and unfaded portions of the swatches selected.

These strips were exposed to the action of the mercury vapor lamp of 220 volts at a distance of 9 inches in such a way that the light after passing through 1¼ millimeters of crown glass (microscope slides) registered fading on the end opposite to that faded by the sun, the sun-faded portion and the intervening portion being protected by a metal screen.

It was found that after twenty hours of continuous exposure to the mercury light, as described, all of the dyes, both direct and basic, registered a degree of mercury light fading which almost exactly balanced that of the sun, so much so that it was not thought necessary to make further tests with glass of different thickness. It was thought, in fact, more important to extend these results to dyes on wool and silk, and to that end steps were at once taken to register sunlight fading on a number of silk and woolen swatches to be used in the same way as the cotton swatches, and thus definitely determine whether the same sort of tempering would serve to equalize the fading for dyes on these fabrics.

To illustrate as well as possible the effect of the fading tests on the cotton swatches, a chart has been prepared in which the dyes are represented as rectangular strips, the degree of fading being represented by a part of the strip cut out. As already explained, the sunlight fading is at one end and the tempered mercury light fading at the other. The intervening fadings represented show the effect of one-half hour and one hour fading by direct mercury light registered on the strips after the regular test, so as to show the reversal of relative fastness between the direct and basic dyes when exposed to the strong untempered mercury light.

Before the experiment with the 1¼ millimeters of crown glass was made it was our practice in the use of the mercury light for testing purposes to make all tests in groups so that for each dye being tested there were several others of known fastness and belonging to the same class to act as standards. By the use of these standards it was possible to draw very reliable conclusions from the results and get them quickly. From now on it is our intention to proceed somewhat as follows in making light tests of colors dyed on cotton:

Dyeings will be exposed first to the strong 220 mercury vapor arc light at a distance of 18 inches for a period of about three hours. Any dyes which stand up under this treatment will be classed forthwith as cotton dyes of the highest degree of fastness. However, dyes which do not come through this test satisfactorily will not be condemned, but will be given another chance. They will be exposed to the 220 mercury light at a distance of 9 inches, the light being allowed to filter through 1¼ millimeters of crown glass. This test will be considered as equivalent to direct sunlight exposure, each hour of lamp exposure to be counted as equal to 2.4 hours of direct December sun at the middle part of a clear day. It will be possible by this procedure in many cases to get a positive answer within three hours, especially with dyes not capable of being destroyed by reduction. Where reducing effects interfere and it becomes necessary to make use of the tempered arc, the answer will still be forthcoming within a period of twenty-four hours.

In conclusion, it should be stated that in selecting the fading effects of the mercury light on dyed cotton for investigation the intention was to attack the most difficult part of the problem of fading first. Taking into consideration the known fact of the greater stability of the cotton dyes on wool and silk, it does not seem too much to assume that even a less degree of tempering will be found to correct any irregularities which may exist here and cause the mercury arc fadings on the animal fibers to parallel those of the sun. The results of tests along these lines will soon be ready and will furnish material for a future communication.—Textile World.

Nineteenth Knitting Arts Exposition Surpasses Former Triumphs

Attendance Sets New Marks—Educational Value High—Much Business Transacted—Practical Value Attested by Exhibitors and Visitors

NOW that it is over, no one questions the success of the Nineteenth Knitting Arts Exposition held last week at the Commercial Museum, Philadelphia. From the numerous standpoints of attendance, number of exhibitors, educational features, business transacted, and, last but not least in real importance, good-will engendered, the huge affair fully lived up to the expectations and faithfully recorded another ambitious chapter in the growth of the industry.

The show was held under the auspices of the National Association of Hosiery and Underwear Manufacturers, which staged its annual convention during the week. The principal credit for the e cient management goes, all agree, to Chester I. Campbell, of Boston, manager of many a textile show during the past two decades and manager for the first time last year of the Knitting Arts Exposition.

The Knitting Arts Exposition has always been notable for the amount of machinery displayed in actual operation—one of the reasons for the many practical benefits to be derived from it—and this year's exhibits were no exception. Every conceivable variety of knitting machine and auxiliary thereto, hosiery dyeing and drying apparatus, raw materials, yarns of all varieties, as well as dyestuffs, was on view. Nor must another very important, though not advertised, feature of the display be overlooked; namely, the hundreds of executives who came themselves to look things over and keep an eye on their own displays. They, too, were an integral part of the affair, and alone constituted a most excellent reason for the attendance of the younger generation of mill men.

A new feature this year, which was of great value to every manufacturer and everyone identified with the industry, was the special department under the direction of the officers of the National Association, conducted for the benefit of its members. Through the efforts of the national president, J. H. Zens, of the Milwaukee Hosiery Company, there was shown an interesting display of the many details of the association's activities, giving a clear idea of the progress that has been made and an outline of the plans for the future. One feature was alone well worth investigating—the work of the research laboratory in connection with representatives of the Bureau of Standards at Washington, D. C.

Another unusual feature of the show was the attendance. Even on the first day—usually a dreary and somewhat dispiriting affair with most trade exhibitions—the attendance up to 6 o'clock had been larger than the full attendance on any previous day at any former Knitting Arts Exposition. Take into consideration the fact that Easter Monday is a holiday in the Quaker City to boot, and some idea of the remarkable pulling power of the affair may be had.

Space forbids anything like a complete account of the many noteworthy features of this show, or an appraisal of the exhibits. Suffice it, then, to say that among the friends of the AMERICAN DYESTUFF REPORTER that occupied booths were the following: American Laundry Machinery Company, Norwood Station, Cincinnati, Ohio; Cooper Hewitt Electric Company, 311 Drexel Building, Philadelphia; E. I. du Pont de Nemours & Co., 126 South Front Street, Philadelphia; Fletcher Works, Glenwood Avenue and Second Street, Philadelphia; Hussong Dyeing Machine Company, Groveville, N. J.; International Nickel Company, 67 Wall Street, New York City; Klauder-Weldon Dyeing Machine Company, Bethayres, Pa.; Mathieson Alkali Works, Inc., Widener Building, Philadelphia; National Aniline & Chemical Company, Inc., 40 Rector Street, New York City; Oakley Chemical Company, 22 Thames Street, New York City; Philadelphia Drying Machinery Company, 3351 Stokley Street, Philadelphia; Proctor & Schwartz, Inc., Seventh Street and Tabor Road, Philadelphia; Roessler & Hasslacher Chemical Company, 709 Sixth Avenue, New York City; Sandoz Chemical Works, Inc., 238 Water Street, New York City; Smith, Drum & Co., Allegheny, below Fifth Street, Philadelphia; Tolhurst Machine Works, Troy, N. Y., and Jacques Wolf & Co., Passaic, N. J.

"INCO" BOOTH FEATURED MONEL METAL BY POINTING OUT OTHER EXHIBITORS AT KNITTING ARTS SHOW

The International Nickel Company's exhibit had a polished monel-metal background, the booths being surrounded by a highly polished nickel railing. No monel-metal dyeing, bleaching and finishing equipment was shown in the booths, but attention was directed to the exhibits of manufacturers of monel-metal machinery, practically all of which featured equipment made of this metal. A new bulletin on "Modern Dyeing, Bleaching and Finishing Equipment" was distributed, and an "attractoscope" showed views of installations in prominent mills. E. A. Turner and H. J. Cole represented the company.

The production of artificial silk in Holland has doubled within the past two years and is now one of the most prosperous industries of the country. The United States has been the best buyer of the Dutch product since the foundation of the industry, but during 1922 this demand fell off, due largely to tariff uncertainties, while Spain increased its purchases enormously as the knitting industry developed in that country. Exports of artificial silk from Holland for the first nine months of 1922 were 1,135,200 pounds, valued at $1,698,960, compared with 608,364 pounds, valued at $913,062 in January-September of 1921.

The Silliko Hosiery Company, Tenth and Diamond Streets, Philadelphia, having purchased the building and equipment of the Delphine Hosiery Company, at Third and Delphine Streets, will remove to the latter building, as soon as improvements are completed therein.

Official Regulations for the Entry and Appraise- of Articles Dutiable Under Paragraphs 27 and 28 of the Tariff Act of 1922

INCLUDING THE LIST OF NON-COMPETITIVE COLORS

U. S. Customs Officials Make Known Method Which Will Guide Decisions—Changes Will Be Made When Deemed Advisable—Non-Competitive List Likewise Not Immutable—Does Not Relieve Appraisers from Duty of Making Independent Appraisement

AT the request of Chief Assistant Appraiser John J. Donnelly, Port of New York, The REPORTER herewith presents the regulations adopted by the U. S. Customs forces for use in handling the products referred to in Paragraphs 27 and 28 of the Tariff Act of 1922. These regulations represent the result of the numerous conferences between the officials and various classes of interested business men—the dye manufacturers, importers, and consumers. It follows the publication on February 26 of tentative regulations which were submitted to all elements of the trade for comment and criticism, and is the result of sifting and weighing the recommendations received. It is "final" only in the sense that it represents the latest effort to establish the administration of the law on a basis satisfactory to all parties concerned. It is not a law. It is merely intended as a guide for officials in their duties, and as information for the trade on what to expect in all general cases.

We likewise present, following the regulations, the prepared list of "non-competitive" colors—that is, those which will not be subject to the heightened duties obtaining in the case of products competing with domestic items. The list is intended to be advisory only, and is subject, the officials say, to change without notice.

REGULATIONS

To Officers of the Customs and Others Concerned:

Regulations for the entry and appraisement of articles dutiable under paragraphs 27 and 28 of the tariff act of 1922 are hereby prescribed as follows:

Regulation 1. Taking Samples Prior to Entry.—An importer may be permitted under proper supervision to take samples from his own importations prior to entry of articles dutiable under paragraphs 27 and 28, and appraising officers may take samples of such articles prior to entry when deemed necessary by them.

Regulation 2. Information Required Prior to Entry.—When an importer seeks information from the appraising officer prior to entry or for the importer's convenience formal entry is withheld as hereinafter provided, in return therefor the importer shall furnish to the appraising officer such relevant information as he may request.

Regulation 3. Determination of Similar Competitive Articles.—(a) A domestic article shall be considered a similar competitive article if in the use or uses which require a major portion of the total consumption in the United States of the imported and the domestic article, the imported article accomplishes results substantially equal to those accomplished by the domestic article when used in substantially the same manner.

(b) An imported article which is or may be used for the same purpose as a domestic article not freely offered for sale but used in the manufacture of another domestic article freely offered for sale shall be considered a similar competitive article.

Regulation 4. Lists of Competitive and Non-competitive Articles.—(a) The appraiser at New York shall issue at once lists of articles which he believes to be competitive and non-competitive, and shall from time to time add articles thereto or remove articles therefrom as investigation shall justify. Such lists shall be advisory only and at the top of each list shall appear the following statement:

"This list is advisory only and in no manner relieves appraising officers from the duty of independent appraisement required by law."

The appraiser shall furnish copies of such lists and amendments thereof to the Customs Information Ex-

change for circulation to other appraising officers and to the public upon request.

(b) In the case of an actual importation of a similar competitive article the appraising officer may furnish to the importer upon application in writing information of the American selling price, provided the appraising officer shall be satisfied that the importer after exercising due diligence has not himself been able to obtain such information and that he has submitted to the appraising office all relevant information in his possession. All information furnished by the appraising officer shall be advisory only. In communicating such American selling price, however, the appraising officer shall not disclose the source of his information.

(c) In the case of non-competitive articles appraising officers shall not advise importers prior to entry concerning values.

Regulation 5. Entry of Articles on Neither the Competitive nor the Non-competitive list.—The appraiser at New York upon application of an importer having an invoice of an article not named on either the competitive or the non-competitive list shall proceed immediately to ascertain to which list the article belongs, and upon such ascertainment shall add the article to such list, pending which the importer may withhold formal entry. The appraiser shall inform the importer of his action.

Regulation 6. Difference in Strength of Imported and Domestic Articles.—When an imported article is of different strength from a similar competitive article manufactured or produced in the United States, the value of the imported article shall be adjusted in relation to the selling price of the domestic article in the proportion which the strength of the imported article bears to that of the domestic.

Regulation 7. Determination of American Selling Price of Articles Not Freely Offered for Sale but Used in the Manufacture of Other Articles.—When an article is a similar competitive article as defined in Regulation 3 (b), the value of the imported article shall be the American selling price of the domestic article freely offered for sale adjusted in the relation that it bears to the domestic article not freely offered for sale.

Regulation 8. Ascertainment of American Selling Price When an Article Is Offered for Sale at Arbitrary Prices.—When the appraising officer shall be satisfied after investigation that a similar competitive domestic article is offered for sale at an arbirary and unreasonable prict not intended to secure bona fide sales and which does not secure bona fide sales, such price shall not be considered as the American selling price, and such officer shall use all reasonable ways and means to ascertain the price that the manufacturer, producer, or owner would have received, within the meaning of Section 402 (f) of the tariff act of 1922.

Regulation 9. Where There Are Two or More Competitive Domestic Articles.—Where two or more domestic articles are considered similar competitive articles as compared with an imported article, the American selling price of the domestic article which accomplishes results most nearly equal to those of the imported article, shall be taken as the basis for the assessment of the ad valorem rate.

Regulation 10. Articles Which Are Not Coal-Tar Products.—The words "similar competitive articles" in paragraphs 27 and 28 shall not be construed as relating exclusively to coal-tar products. An imported coal-tar product may be compared with a domestic non-coal-tar product, or an imported non-coal-tar product dutiable under paragraph 27 or 28 with a domestic coal-tar product, for the purpose of determining whether they are similar competitive articles. The rule provided in paragraphs 27 and 28 for the determination of similar competitive articles and the regulations herein provided shall be applied in such cases.

Regulation 11. Ascertainment of United States Value.—The following instructions for the ascertainment of United States value are reproduced from Treasury Decision No. 39297 of October 31, 1922:

"(T. D. 39297)

"UNITED STATES VALUE OF IMPORTED MERCHANDISE

"Appraising officers instructed how to ascertain 'the United States value of imported merchandise' as defined in Title IV, Section 402, subdivision (d), tariff act of 1922.

"Treasury Department, October 31, 1922.

"To Appraising Officers:

"Attention is invited to the definition in Title IV, Section 402, subdivision (d), tariff act of 1922, of the term 'the United States value of imported merchandise.'

"Certain questions having arisen in connection with the application of this definition to imports classifiable under paragraphs 27 and 28 of Title I of the act, the department offers the following concrete example as best illustrating its views on the procedure and computations necessary in arriving at the United States value of such merchandise:

"Assume that certain dyes classifiable under paragraph 28 were exported from Germany on September 15, 1922, and imported at New York on October 1, 1922; and that the 'such or similar imported merchandise' which subdivision (d), Section 402, Title IV, contemplates shall be taken as the standard of comparison was selling at New York on September 15, 1922, in the usual wholesale quantities, etc., at $1.45 per pound. This price includes the various items for which subdivision (d) provides that allowance shall be made. Assume a maximum allowance of 8 per cent for profit; dividing $1.45 by 1.08 gives $1.34 and subtracting this from $1.45 leaves 11 cents as the amount of the profit included in the $1.45. Assume a maximum allowance of 8 per cent for general expenses, dividing $1.34 by 1.08 gives $1.24 and subtracting this from $1.34 leaves 10 cents as the amount of the general expenses, included in the $1.45. Assume that the cost of transportation, insurance and other necessary expenses from the place of shipment in Germany to

New York was 3 cents and deducting this from $1.24 leaves $1.21, which includes the dutiable value and the duty. Assume that such merchandise was an article which on September 15 was dutiable under Section 500 of the act of September 8, 1916, at 30 per cent ad valorem. Dividing $1.21 by 1.30 gives 93 cents as the value upon which duty was assessed, and which is the United States value of the merchandise imported on October 1, and subject to the 60 per cent ad valorem rate provided for in the proviso of paragraph 28. When the article is subject to both a specific and ad valorem rate, the specific duty will be deducted before making the division.

"The amount to be deducted as duty in each case will be governed by the amount of duty actually paid on the article used as the basis for computation.

"The foregoing applies to purchased goods. In the case of consigned goods the appraiser will ascertain the amount of commission paid or contracted to be paid and allow not to exceed 6 per cent of the gross selling price, in lieu of the 8 per cent profit and 8 per cent general expense. The transportation costs and duty will be ascertained in the same manner as on purchased goods

Appraising officers will ascertain in the usual way through the special agency service or otherwise, as provided by law and regulations, the facts necessary to be used in such computations.

"EDWARD CLIFFORD, Assistant Secretary."

Regulation 12. Tests.—Tests which are necessary in the appraisement of imported articles shall be made under conditions approximating as closely as practicable the conditions in which the articles will be actually used in trade or manufacture.

Regulation 13. Trade Papers as Sources of Information.—Appraising officers may consult the trade papers but the weight to be given to the quotations and other information therein is for the determination of the officers themselves

Regulation 14.—Obtaining Information on Doubtful Questions.—Appraising officers at ports other than New York when in doubt on any question arising under paragraphs 27 and 28 shall take the question up direct with the appraiser at New York, who shall give his advice as promptly as possible. If the appraising officer shall be dissatisfied with the advice of the appraiser at New York, or the latter shall be in doubt on the inquiry, the question shall be submitted to the department for an expression of its views.

EDWARD CLIFFORD, Assistant Secretary.

NON-COMPETITIVE LIST

The following imported dyes are not considered similar to or competitive with any dyes of American manufacture at the present time.

This list is advisory only, and in no manner relieves appraising officers from the duty of independent appraisement required by law.

This list is subject to change without notice.

INDEX LETTERS FOR FOREIGN MANUFACTURERS

(A)—Actien-Gesellschaft for Aniline Fabrication, Germany
(AW)—A. Weischer & Co., Belgium.
(B)—Badische Anilin, Germany
(BA Co.)—British Alizarine Co., London, England.
(BE)—C. vom Bauer, Elberfeld, Germany.
(BK)—Leipziger Anilinfabrik Beyer & Kegal, Germany.
(BM)—Gebr. Broemme, St. Petersburg, Russia.
(By)—Bayer & Co., Leverhusen, Germany.
(C)—Cassella & Co., Frankfort, Germany.
(Cl. Co.)—Clayton Aniline Co., Manchester, England.
(CJ)—Carl Jager, Dusseldorf, Germany
(CR)—Clauss & Ree, Manchester, England.
(CV)—Colne Vale Chem. Co., Huddersfield, England.
(CZ)—Casthelaz, Bruere & Co., France.
(DAW)—Dawson & Co., Huddersfield, England.
(DH)—Durand, Huguenin & Co., Basle, Switzerland.
(EH)—E. de Haen, Hanover, Germany.
(FA)—Farbwerk Ammersfoort, Holland.
(FTM)—Fabriques de Thann & de Mulhouse, France.
(G)—Geigy, Basle, Switzerland.
(GE)—A. George, France
(GR)—Robert Grasser, North Wales, England
(Gr-E)—Griesheim Elektron, Frankfort, Germany.
(H)—Read Halliday Sons, Ltd., Huddersfield, England
(J. Hauff)—J. Hauff Co., Feuerbach, Germany.
(J)—Society for Chemical Industry, Basle, Switzerland.
(K)—Kalle Co., Bierbuch, Germany
(KI)—Kinzlberger Co., Prague, Austria.
(L)—Leonhardt Co., Frankfort, Germany.
(LD)—Lepetit, Dollful & Gausser, Susa, Italy.
(LEV)—Levinstein, Manchester, England.
(LJ)—Laroche & Juillard, Lyons, France.
(LO)—Lowe Co., Manchester, England.
(LP)—L. Picard Co., St. Fous, France.
(M)—Meister, Lucius & Bruning, Germany.
(M LY)—Mfr. Lyonnaise de Matieres, Lyons, France.
(NF)—Neiderlandische Farber & Chem Co., Holland.
(NJ)—Chemikaleinwork Gricoheim, Germany.
(P)—Society Anonyme, St. Denis, France.
(RD)—Roberts, Dale Co., Manchester, England.
(RE)—Remy Co., Germany
(RF)—Ruch & Fils, France.
(RW Co.)—R. Wedekind Co., Uerdingen, Germany.
(S)—Sandoz Co., Basle, Switzerland.
(SB)—Sevoz & Boasson, Lyons, France.
(t-M)—Weiler-ter-Meer, Germany
(v. Heydon)—Fabrik von Heyden, Dresden, Germany.
(V. St.)—Victor Steiner, St. Mariel, France.
(W)—Williams Bros. Co., Middlesen, England.
(WDC)—Wulfing, Dahl Co., Elberfeld, Germany.

Name of Dye and Manufacturer	Schultz or Norton No.
Acid Alizarine Black R—(M)	159
Acid Alizarine Blue BB—(M)	790
Acid Blue 6G—(C)	546
Acid Ponceau—(DH) (S)	175
Acid Pure Blue R Supra—(G)	U603
Acid Rhodamine BG—(B)	U94
Acid Rhodamine G—(B)	U95
Acid Rhodamine R (I)	...
Acridine Orange NO—(L) (SB)	603
Acridine Orange R Ex—(L) (SB)	604
Acridine Scarlet R—(L) (SB)	...
Acridine Scarlet 3R—(L) (SB)	...

Name of Dye and Manufacturer	Schultz or Norton No.
Acridine Yellow GRT—(L) (SB)	602
Algol Blue 3G—(By)	844
Algol Blue K—(By)	839
Algol Blue 3R—(By)	821
Algol Brilliant Orange FR—(By)	822
Algol Brilliant Violet 2B—(By)	821
Algol Brilliant Violet R—(By)	820
Algol Brown B—(By)	869
Algol Corinth R—(By)	870
Algol Green B—(By)	847
Algol Gray B, 2B—(By)	834
Algol Olive R—(By)	833
Algol Orange R—(By)	824
Algol Red B—(By)	825
Algol Red 5G—(By)	816
Algol Rose R (Pink)—(By)	818
Algol Yellow 3G—(By)	811
Alizarine Astrol B, G—(By)	856
Alizarine Black S—(M)	807
Alizarine Blue (Soluble) ABS—(BA Co.)	804
Alizarine Blue S, SW—(B) (By), SR—(B) (By) (M), SRW—(B) (M)	804
Alizarine Bordeaux B, BD—(By)	787
Alizarine Carmine—(BA Co.)	780
Alizarine Claret R Paste—(M)	U404
Alizarine Cyanine G—(By)	799
Alizarine Cyanine 3R—(By)	787
Alizarine Cyanine WRS, DRS Ex., BBS, 3RS —(By)	790
Alizarine Cyanole Violet R—(C)	852
Alizarine Dark Blue SW—(B), S—(M)	804
Alizarine Direct Violet R—(M)	852
Alizarine Emeraldole G—(By)	...
Alizarine Fast Gray DBL—(M)	U416
Alizarine Garnet R—(M)	797
Alizarine Green S—(M)	805
Alizarine Green X, WX, S, SW—(B)	808
Alizarine Indigo B—(By)	894
Alizarine Indigo G—(By)	893
Alizarine Indigo 3R—(By)	895
Alizarine Indigo Blue S, SW, SMW—(B)	809
Alizarine Irisol D, R—(By)	852
Alizarine Pure Blue—(By)	855
Alizarine Red S—(B), IWS—(M)	780
Alizarine Uranole 2B—(By)	U211
Alizarine Uranole R—(By)	U212
Alizarine Viridine DG, FF—(By)	854
Alizarine W, W Ex.—(By), SA—(BA Co.)	780
Alkali Blue 6B—(J) (H) (C), D—(A)	535
Alkali Fast Green 3G—(By)	U213
Alkali Violet 6B, O, R, LR, C, CA, A—(B) (J) (M) (By) (C) (t-M)	532
Amethyst Violet—(K)	686
Anisoline—(Mo)	574
Anthosine B—(B)	U97
Anthosine 3B—(B)	U98
Anthosine 5B—(B)	U99
Anthracene Blue SWX, SWX Ex.—(B)	790
Anthrachinon Blue SR Ex.—(B)	861
Anthrachinon Violet—(B)	853
Anthracyanine BGG, SR—(DH)	627
Anthraflavone G—(B)	759
Auramine G—(B) (G) (J)	494
Aurine (Acid Free)—(GR) (LO) (MO) (RD)	555
Azo Acid Black B—(M)	A418
Azo Acid Black 3BL Ex.—(M)	A419
Azo Carmine B, BX—(B)	673
Azo Carmine G—(B)	672
Azo Orseille 2B—(C)	A334
Benzo Chrome Blue Black B—(By)	A157
Benzo Fast Bordeaux 6BL—(By)	A170
Benzo Fast Brown GL—(By)	...
Benzo Fast Brown 3GL—(By)	A171
Benzo Fast Brown KL—(By)	A172
Benzo Fast Eosine BL—(By)	A173
Benzo Fast Gray BL—(By)	A175
Benzo Fast Heliotrope BL—(By)	A176
Benzo Fast Heliotrope 4BL—(By)	A177
Benzo Fast Heliotrope 3RH—(By)	A178
Benzo Fast Heliotrope 2RL—(By)	A179
Benzo Fast Orange 2RL—(By)	A180
Benzo Fast Rubine BL—(By)	A183
Benzo Fast Violet 4BL—(By)	...
Benzo Rhodoline Red 3B—(By)	A204
Black Base S—(B)	U103
Blue—(NF)	126
Blue BSJ—(Gr-E)	U504
Blue RR—(Gr-E)	U506
Blue RVX—(P)	535
Blue Madras P—(P)	126
Brilliant Alizarine Bordeaux R—(By)	787
Brilliant Alizarine Viridine F—(By)	854
Brilliant Anthrazurol Powder—(B)	U105
Brilliant Benzo Fast Violet 4B—(By)	...
Brilliant Benzo Fast Violet 2RL—(By)	A206
Brilliant Benzo Green B—(By)	A207
Brilliant Benzo Violet B—(By)	A208
Brilliant Benzo Violet 2R—(By)	A209
Brilliant Carmine CL Ex.—(B)	U106
Brilliant Carmine L—(B)	U108
Brilliant Copper Blue GW—(A)	U77
Brilliant Cresyl Blue BB—(L)	621
Brilliant Fast Blue B—(By)	A210
Brilliant Fast Blue 3BX—(By)	A211
Brilliant Fast Blue 2G—(By)	A212
Brilliant Fast Blue 4G—(By)	A213
Brilliant Glacier Blue—(J)	501
Brilliant Indigo BASF/B—(B)	885
Brilliant Indigo BASF/G—(B)	886
Brilliant Indigo BASF/4G—(B)	887
Brilliant Milling Blue 46P 1719—(C)	U281

Name of Dye and Manufacturer	Schultz or Norton No.
Brilliant Rhoduline Blue R—(By)	...
Brilliant Pure Yellow 6G—(By)	U219
Brilliant Rhoduline Red B, BD—(By)	684
Brilliant Rose G—(L)	572
Brilliant Rose 5G—(L)	571
Brilliant Sky Blue 8G Ex.—(By)	U223
Brilliant Sulfon Red B—(S)	182
Capri Blue GON, V—(L) (By)	620
Carbazol Yellow W—(C)	...
Chloramine Brilliant Red 10B—(S) (By)	...
Chloramine Brilliant Red 8B—(S) (By)	...
Chloramine Brown G—(By)	A218
Chlorantine Fast Bordeaux—(J)	...
Chlorantine Fast Brown—(J)	...
Chlorantine Fast Helio RS—(J)	...
Chlorantine Fast Rubine RL—(J)	...
Chlorantine Fast Violet BL, 4BL, 2RL, RL—(J)	...
Chlorantine Fast Yellow RL—(J)	...
Chromacetin S—(DH)	...
Chromanil Black BF—(A)	A2
Chromanil Black FF Ex.—(A)	A3
Chromate Blue G for printing—(G)	552
Chrome Azurol S—(G)	554
Chrome Brown TV—(J)	...
Chrome Citronone R—(J)	...
Chrome Fast Brown A Conc.—(G)	A674
Chrome Fast Olive B—(J)	...
Chromo Purpurine H Paste—(DH)	U597
Chromo Rhodine 6G, 6GN, B, BN—(DH)	...
Chromoxane Brilliant Blue G—(By)	...
Chromoxane Violet B—(By)	...
Ciba Gray G—(J)	899
Ciba Heliotrope B—(J)	897
Ciba Orange G—(J)	911
Ciba Red B—(J)	909
Ciba Red G—(J)	906
Ciba Red R—(J)	908
Ciba Scarlet G—(J)	907
Ciba Violet B—(J)	901
Ciba Violet 3B—(J)	900
Ciba Yellow G—(J)	890
Cibanone Black B—(J)	794
Cibanone Blue G—(J)	...
Cibanone Blue 3G—(J)	793
Cibanone Brown B, V—(J)	868
Cibanone Green B—(J)	...
Cibanone Orange R—(J)	792
Cibanone Yellow R—(J)	795
Coelestine Blue B—(By)	641
Coralline Yellow—(Gr) (LO) (Ma) (RD)	555
Coreine RR—(DH)	641
Corvoline BT Lumps—(B)	U121
Cresyl Blue 2RN, 2BS—(L)	621
Cresyl Fast Violet 2B Ex.—(L)	U517
Cyananthrol G—(B)	860
Cyananthrol R—(B)	859
Cyanzurine—(DH)	630
Cyanol Ex. FF, AB, GG, C, V, VN, BN, BB, BSB, H Ex.—(C) (M LY)	546
Cyanosin—(DH)	596
Diamine Azo Blue 4Y 485—(C)	A340
Diamine Azo Scarlet 58P 2022—(C)	A342
Diamine Brilliant Rubine 56Y 1979—(C)	A413
Diamine Brilliant Scarlet 58K 2017—(C)	A344
Diamine Bronze G—(C) (M LY)	448
Diamine Dark Blue B—(C)	A347
Diamine Fast Black 32A 1355—(C)	A349
Diamine Fast Bordeaux 61Y 2108—(C)	A352
Diamine Fast Brown 34E 1409—(C)	A353
Diamine Fast Orange 2A 605—(C)	A355
Diamine Fast Violet 43B 1631—(C)	A358
Diamine Gray G—(C)	A359
Diamine Heliotrope H F835—(C)	A360
Diaminogen B Ex.—(C)	274
Diaminogen Blue BB—(C)	273
Diaminogen Sky Blue 3B—(C)	...
Diaminogen Sky Blue N Conc.—(C)	A373
Diazamine Blue BR	...
Diazanil Blue BB—(M)	273
Diazanil Pink B—(M)	...
Diazine Black—(K)	125
Diazine Blue—(K)	126
Diazine Green S—(K)	124
Diazo Brilliant Green 3G—(By)	...
Diazo Brilliant Orange 5G Ex.—(By)	...
Diazo Brilliant Orange GR Ex.—(By)	A226
Diazo Brilliant Scarlet 8A, BA, 3BA, ROA, ROR—(By)	...
Diazo Brilliant Scarlet B Ex.—(By)	A227
Diazo Brilliant Scarlet 3B Ex.—(By)	A228
Diazo Brilliant Scarlet 2BL Ex.—(By)	A230
Diazo Brilliant Scarlet 5BL—(By)	A231
Diazo Brilliant Scarlet 6B Ex.—(By)	A232
Diazo Brilliant Scarlet G Ex.—(By)	A233
Diazo Brilliant Scarlet S4B—(By)	A235
Diazo Fast Bordeaux BL—(By)	A248
Diazo Fast Green BL, 3G, GF—(By)	...
Diazo Fast Red 7BL—(By)	A250
Diazo Fast Violet BL—(By)	A251
Diazo Fast Violet 3RL—(By)	A252
Diazo Fast Yellow G—(By)	A253
Diazo Fast Yellow 2G—(By)	A254
Diazo Indigo Blue 4GL—(By)	...
Diazo Light Green BL—(By)	...
Diazo Olive G—(By)	A255
Diazo Rubine B—(By)	A256
Diazo Sky Blue B—(By)	A257
Diazo Sky Blue 3GL—(By)	A258
Diazo Yellow R—(By)	...

Name of Dye and Manufacturer	Schultz or Norton No.
Diazogene Orange GR—(CJ)	...
Diphene Blue R—(A)	690
Diphenyl Catechine G—(G)	206
Direct Chrome Brown—(AW)	A552
Double Green SF—(K)	519
Eosamine B, G—(A)	100
Eosine Bluish—(S)	596
Eosine 10B—(C) (MLY)	596
Eosine S—(B)	589
Eriocarmine 2BC—(G)	A639
Eriochrome Azurol B—(G)	551
Eriochrome Flavine A Conc.—(G)	...
Eriochrome Geranol R Conc.—(G)	U614
Eriochrome Green O—(G)	U618
Eriochrome Phosphine R—(G)	133
Eriochrome Red G—(G)	...
Erio Green Ex.—(G)	564
Ethyl Purple 6B—(B)	518
Ethyl Violet—(B) (J) (G)	518
Euchrysine 2G, R, RR—(B)	608
Euchrysine 3R—(B)	603
Fast Acid Marine Blue HBBX—(B)	U138
Fast Acid Ponceau—(DH) (S)	175
Fast Black—(L)	658
Fast Black B—(B)	740
Fast Blue B—(t-M)	126
Fast Blue Black—(L)	658
Fast Green Ex. CR, W—(By)	523
Fast Green B Ex.—(TM)	U529
Fast Mordant Blue B—(M)	A430
Fast Mordant Blue R—(M)	A431
Fast Pink for Silk—(DH)	694
Fast Sulphon Violet 5BS, 4BS, 4R—(S)	182
Flavinduline O II—(B)	668
Fluorescent Blue—(J) (S)	648
Gallamine Blue—(G) (By)	637
Gallo Green DH—(DH)	629
Gallo Violet DT—(By)	...
Gallo Viridine G—(By)	...
Glacier Blue—(J)	501
Golden Yellow (Jaune d'or)—(DH) (MLY) (S)	6
Halfwool Blue R—(M)	126
Halfwool Green B—(M)	124
Hansa Green G Powder—(M)	U437
Hansa Rubine G Powder—(M)	U438
Hansa Yellow G Lumps—(M)	U440
Hansa Yellow 5G Lumps—(M)	U441
Helindone Black B, BB, BBB—(M)	...
Helindone Blue 3G—(M)	...
Helindone Brown AN—(M)	873
Helindone Brown G—(M)	904
Helindone Brown 3GN—(M)	836
Helindone Brown 2R—(M)	902
Helindone Fast Scarlet C—(M)	907
Helindone Fast Scarlet R—(M)	915
Helindone Golden Orange I, G, IRRT—(M)	...
Helindone Green G—(M)	892
Helindone Gray 2B, BR—(M)	921
Helindone Orange D—(M)	914
Helindone Orange R—(M)	913
Helindone Pink AN—(M)	...
Helindone Red B—(M)	917
Helindone Red 3B—(M)	918
Helindone Rose BN—(M)	910
Helindone Scarlet S—(M)	916
Helindone Violet B, BB, R—(M)	920
Helindone Yellow 3N, RN, 3RN—(M)	...
Helindone Yellow 3GN—(M)	810
Helio Fast Violet AL—(By)	A269
Heliotrope B, 2B—(K)	686
Hydron Bordeaux B, R—(C)	...
Hydron Brown G, R, OG—(C)	...
Hydron Green B, G—(C)	...
Hydron Olive G, GN, OG—(C)	...
Hydron Orange R—(C)	...
Hydron Pink FB, FF—(C)	...
Hydron Scarlet 2B, 3B—(C)	...
Hydron Violet B, R—(C)	...
Immedial Direct Blue 35C 1432—(C)	S75
Immedial Violet C—(C)	S81
Indamine 6R—(NJ)	705
Indanthrene Blue WB—(B)	850
Indanthrene Gold Orange G—(B)	760
Indanthrene Gold Orange R—(B)	761
Indanthrene Orange RT—(B)	812
Indanthrene Red BN Ex.—(B)	831
Indanthrene Red R—(B)	830
Indanthrene Scarlet G—(B)	762
Indigene Black BW—(J)	...
Indigene Blue BB—(J)	A701
Indigene Blue R—(J)	A702
Indigo MLB/T—(M), Pure BASF/G—(B)	888
Indigo Yellow 3G Ciba—(J)	889
Indogenine—(NF)	126
Indole Blue B, R—(A), 4B, F, L—(L)	126
Indone Blue 2B, 2R—(By)	126
Indoine Blue R, RB, BR—(B)	126
Indoine Powder B, 2B, R, 2R—(G)	126
Indophene Blue—(M)	126
Isamine Blue—(C)	U288
Irisamine G, G Ex.—(C)	576
Iris Blue—(B)	648
Iris Violet—(B)	686
Janus Black D, I, II, O—(M)	...
Janus Blue G, R—(M)	126
Janus Bordeaux B—(M)	...

Name of Dye and Manufacturer	Schultz or Norton No.
Janus Brown B, R—(M)	435
Janus Dark Blue B, R—(M)	126
Janus Green B, G—(M)	124
Janus Gray B, 2B—(M)	128
Janus Red B—(M)	240
Janus Yellow G, R—(M)	222
Japan Black Ex.—(B)	U145
Japan Black B Ex.—(B)	U146
Lake Black P—(G)	U630
Lake Purple 3B—(B)	U157
Lake Red P—(M)	132
Lanasol Blue B—(J)	...
Lanasol Brown 2R—(J)	...
Lanasol Red G—(J)	...
Light Green—(t-M)	519
Lilac PC—(G)	U631
Lithol Fast Orange R 15813—(B)	A82
Magdala Red and Rose—(DH)	694
Manchester Yellow—(H) (LEV) (RD)	6
Martius Yellow—(A) (BK)	6
Metachrome Blue Black 2BK—(A)	U30
Metachrome Olive Brown G—(A)	A26
Metaphenylene Blue R—(C)	690
Methyl Alkali Blue—(B) (M) (G) (Gr-E) (DH) (K)	535
Methyl Green—(K) (t-M) (P)	519
Methyl Green Crystals—(A)	519
Methyl Green Crystals I, Y, B—(By)	519
Methyl Heliotrope O—(M)	687
Methylene Yellow H—(M)	618
Milling Blue—(K)	693
Milling Green 228—(WDC)	523
Milling Scarlet B, S—(CL Co.)	484
Milling Yellow 3G—(A)	U43
Milling Yellow X191—(C)	U378
Modern Azurine DH—(DH)	640
Modern Blue—(DH)	629
Modern Cyanines—(DH)	627
Monochrome Brown BX—(By)	U252
Naphtha Chrome Azurine B—(J)	...
Naphtha Chrome Violet R—(J)	...
Naphthaline Green V—(M) (J)	564
Naphthaline Yellow—(C) (L) (t-M) (LEV) (WDC)	6
Naphtindone BB, BR, T—(C)	126
Naphthochrome Violet R—(J)	U678
Naphthogene Blue B—(A)	A28
Naphthogene Blue 2R—(A)	A29
Naphthogene Blue 4R—(A)	A30
Naphthol Yellow—(SB)	6
Naphthylamine Rose—(DH)	694
Naphthyl Blue—(K)	693
Naphthylamine Yellow—(K) (By)	6
Neolan Blue B, G—(J)	...
Neolan Green B—(J)	...
Neolan Gray B—(J)	...
Neolan Red B, R—(J)	...
Neolan Violet R—(J)	...
Neolan Yellow G, R—(J)	...
Neutral Blue—(C) (MLY)	676
Neutral Violet O—(M)	U456
New Claret R—(B)	A86
New Ethyl Blue BS—(M)	U457
New Methylene Blue GG—(C), NGG—(MLY)	651
New Methylene Blue N, NSS, NSSF, NX, GB, R, 3R—(C), N—(MLY)	663
New Solid Green 3B—(J)	496
Night Blue—(B) (J) (S)	560
Nigrophor BASF—(B)	218
Nile Blue A—(B)	653
Oil Yellow R Powder—(B)	U172
Orange for Leather A—(P)	603
Oxamine Acid Brown G—(B)	A87
Oxamine Brilliant Violet RX—(B)	A94
Oxamine Fast Pink BX—(B)	A112
Oxamine Light Brown G—(B)	A115
Oxy Diaminogen 13A 880—(C)	A387
Palatine Chrome Red B—(B)	A126
Paper Fast Bordeaux B—(By)	U255
Para Blue—(NJ)	702
Padaphenylene Violet—(WDC)	695
Pegu Brown G—(L)	A511
Phenocyanine VS, R, TC—(DH)	642
Phloxine N, BB—(M) (CJ)	596
Pluto Black A Ex.—(By)	A286
Pluto Black G 28241—(By)	A290
Pluto Brown GG—(By)	A292
Pluto Brown R—(By)	A294
Polar Maroon V Conc.—(G)	...
Polar Red B, BC Conc., BS—(G)	...
Polar Red RS Conc.—(G)	U638
Ponceau for Silk—(P)	175
Primrose DH (Spirit)—(DH)	589
Pyrazol Fast Brown B—(S)	...
Pyrogene Orange R—(J)	S164
Pyrogene Violet—(J)	...
Radio Black SB, ST—(C)	...
Radio Brown B, S—(C)	...
Radio Red G—(C)	...
Radio Yellow R—(C)	...
Rapid Fast Blue B—(Gr-E)	...
Rapid Fast Brown B—(Gr-E)	...
Rapid Fast Orange RG—(Gr-E)	...
Rapid Fast Red B, BG, GL, 2G—(Gr-E)	...
Rheonine A, AL, N—(B)	607
Rhodamine S, S Ex.—(B) (J) (By)	570

Name of Dye and Manufacturer	Schultz or Norton No.
Rhodamine 6G, 6G Ex.—(B) (J) (M) (H)	571
Rhodamine G, G Ex.—(B) (J) (M) (K) (S)	572
Rhodamine 3B, 3B Ex.—(B) (J)	574
Rhodamine 3G, 3G Ex.—(B)	576
Rnoduline Red B, G, GD—(By)	684
Rhoduline Sky Blue 3G—(By)	...
Rhoduline Violet—(By)	684
Rhoduline Yellow T—(By)	618
Rosalane O, T, R, BO—(M)	687
Rosalane—(P)	688
Rosenduline 2B—(K)	673
Rosenduline G—(K)	675
Rosanthrene GWL Ex.—(J)	...
Rosanthrene Bordeaux BL—(J)	...
Rosanthrene Bordeaux B 400%—(J)	A708
Rosanthrene Fast Bordeaux 2BL—(J)	...
Rosanthrene Fast Red 7BL, LRM—(J)	...
Rosanthrene Rose—(J)	...
Rosazine—(P)	672
Rose JB (Spirit)—(J)	589
Salicine Bordeaux R—(K)	A404
Scarlet for Silk—(B)	175
Steoglaucine O—(G)	496
Setocyanine O—(G)	500
Silk Ponceau G—(K)	175
Solid Blue B for Cotton—(Gr-E)	126
Sulpho Rhodamine BG—(B)	...
Special Blue G—(B)	U190
Spirit Eosine—(t-M) (M)	589
Sulphon Acid Green B—(By)	U262
Sulphon Orange G—(By)	A297
Supramine Black—(By)	...
Supramine Brown R—(By)	U263
Supramine Yellow R—(By)	U264
Thiazine Brown R—(B)	U192
Thioflavine T—(C) (M L Y)	618
Thiogene Violet B—(M)	...
Thio Indigo Brown R—(K)	902
Thio Indigo Brown G—(K)	904
Thio Indigo Gray 2B—(K)	921
Thio Indigo Orange R—(K)	913
Thio Indigo Red B—(K)	912
Thio Indigo Red 3B—(K)	918
Thio Indigo Red BG—(K)	917
Thio Indigo Rose B, RN—(K)	...
Thio Indigo Rose BN, AN—(K)	910
Thio Indigo Scarlet G—(K)	906
Thio Indigo Scarlet 2G—(K)	907
Thio Indigo Scarlet R—(K)	905
Thio Indigo Violet 2B—(K)	920
Thio Indigo Scarlet S—(K)	916
Thio Indigo Violet K—(J)	900
Thional Brilliant Blue 6B—(S)	...
Thiondon Green G—(K)	892
Thiomine Blue GO, OB, R—(M) (By)	661
Toluylene Fast Brown 3G—(By)	U265
Toluylene Fast Brown 2R—(By)	U266
Typophor Black FB—(B)	U193
Typophor Brown FR—(B)	U195
Typophor Carmine FB—(B)	U196
Typophor Red FG—(B)	U197
Typophor Yellow FR—(B)	U198
Ultra Violet LGP—(S)	632
Vac Blue—(H)	126
Vacancine Blue—(H)	126
Vat Heliotrope R—(B)	...
Vat Pink AX, B, R—(B)	...
Vat Red—(B) (By)	912
Violet—(CZ)	688
Violet (Bichromate)—(P)	688
Wool Black N—(M)	A441
Wool Fast Blue BL—(B)	U201
Wool Fast Blue BL—(By)	U271
Wool Fast Blue GL—(By)	U272
Yellow Naphthol (Jaune Naphthol)—(SB)	6
Zambesi Bordeaux TB—(A)	A57
Zambesi Brown G, GG—(A)	330
Zambesi Scarlet 6B Ex.—(A)	A63

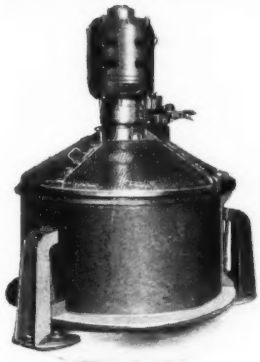
WANTED—Copies of the February 12, 1923, issue of AMERICAN DYESTUFF REPORTER. Owing to extra demand, our file copies of Vol. XII, No. 4, issue of February 12, 1923, have been exhausted. Anyone willing to part with one or more copies will confer a favor by addressing this office. AMERICAN DYESTUFF REPORTER, 4109 Woolworth Building, New York City.

EXPERIENCED SILK DYER WANTED

Wanted—Experienced silk dyer to take position as assistant in a piece dyeing establishment which produces a varied line of all-silk, silk and wool, and silk and cotton fabrics. Also an experienced silk skein dyer. In making application please state fully age, education, previous employments, nationality, and salary required to accept position. No one without silk dyeing experience need apply. Address Box 224, care of the American Dyestuff Reporter.

WANTED by large dyestuff manufacturer an assistant to chemist in charge of application laboratory. Good dye testing and executive ability necessary. In application state fully, education and experience and give references. Address Box 226, American Dyestuff Reporter.

FLETCHER
VERTICAL MOTOR DRIVEN
EXTRACTORS



BALL BEARINGS—PUSH BUTTON CONTROL
HEAVY DUTY MOTOR—REINFORCED HOUSING

FLETCHER WORKS

FORMERLY SCHAUM & UHLINGER
Glenwood Avenue, at Second Street
PHILADELPHIA, U. S. A.
Other dependable types are belt driven, electric underdriven, and steam turbine driven.

P&B P&B

IMPORTED

Potassium Permanganate
U. S. P.

Blood Albumen

Glues and Gelatine

Pfaltz & Bauer, Inc.
300 PEARL STREET-NEW YORK

P&B P&B

Latest 1914 Berlin Edition of

"FARBSTOFFTABELLEN"

By Dr. Gustav Schultz

Containing over 1000 dyestuff formulæ reprinted and exactly reproduced by photographic process on fine white paper, and substantially bound in heavy black cloth and leather.

Can now be had from us at $10 per volume.

HOWES PUBLISHING COMPANY

4109 Woolworth Building, New York

AGAIN AVAILABLE

——WHITTAKER'S BOOK——

"The Testing of Dyestuffs in the Laboratory"

THE eighth importation of this newest and most popular work by Mr. Whittaker has arrived and back orders are now being filled. We have a small surplus which are available for immediate shipment to those who act promptly.

"The Testing of Dyestuffs in the Laboratory" presents in condensed form the results of over twenty years' practical experience. It deals in general with the dyestuff testing laboratory and its functions and in particular with methods for the testing and evaluation of the different types of dyestuff, including the natural colors. Every dye chemist should order his copy NOW to insure early delivery.

PRICE $5.00, POSTAGE PAID

HOWES PUBLISHING COMPANY

4109 Woolworth Building NEW YORK CITY

TECHNICAL BOOKS

If you are in the market for books on technical subjects — dyeing, finishing, bleaching, etc. — communicate with us and it is probable that we can supply your needs. We shall at all times be glad to submit lists of books covering any special lines.

We call particular attention to

A TEXTBOOK OF DYE CHEMISTRY

By G. VON GEORGIEVICS

This is a new edition of a former volume by the same author, entitled "Chemistry of Dyestuffs," and has been thoroughly revised and brought down to date by Dr. Eugene Grandmougin—translated by Frederick A. Mason. The new edition describes minutely the chemical properties of all dyestuffs, including the natural colors, and contains particularly a new chapter on the Vat Colors

PRICE $12.50

DYERS' MATERIALS

By PAUL HEERMANN

An introduction to the examination, valuation and application of the most important substances used in dyeing, printing, bleaching and finishing. Translated by Arthur C. Wright. Second edition, revised and enlarged by H. B. Stocks. PRICE $3.00

HOWES PUBLISHING CO.

4109 Woolworth Building NEW YORK CITY

Sometimes It Pays

Sometimes it pays to go to a bank and borrow money. Sometimes borrowing money is the wisest and most profitable thing in the world to do.

But bankers never employed the slogan, "It pays to borrow."

Rather, they counsel carefully with a man before they advise him to borrow—for his own safety, as well as their own. They do not promote borrowing as something practically sure of success.

Perhaps that is one reason why bankers have never understood the expression, "It pays to advertise."

Advertising sometimes pays, just as borrowing sometimes pays, just as investment sometimes pays, just as manufacturing sometimes pays.

Advertising is not the sum of all the economic laws. The man who uses advertising must have a different conception of it than as something that is sure to pay.

That is what advertising agencies are for—to keep men from believing things about advertising that are not true.

[Published by the American Dyestuff Reporter in co-operation with The American Association of Advertising Agencies]

THE NEWPORT COLORS

For Satisfaction

No sale is considered complete until the customer is entirely satisfied, and to insure this, several precautions are instituted which, since they guard your interests, merit your consideration when placing dyestuff orders.

PROGRAM

Our manufacturing program is based on trade requirements; i. e., WE HAVE THE COLOR YOU NEED.

SERVICE

Our sales force is augmented by an efficient application laboratory and a corps of specialists who can visit your mill and demonstrate practically the solution of your dyeing and color problems.

UNIFORMITY AND DEPENDABILITY

We maintain an independent laboratory where the most elaborate and cautious tests are conducted to insure the maintenance of strength and shade of every batch of color. For pulverizing, standardizing and mixing, the latest and most ingenious devices are used under the constant superintendence and study of experienced engineers.

STOCKS AND TRANSPORTATION

Warehouses are stocked and so located, and truck and rail routes so arranged, as to give our customers the promptest possible deliveries.

NEWPORT CHEMICAL WORKS, Inc.

PASSAIC, NEW JERSEY

BOSTON, MASS. PROVIDENCE, R. I. PHILADELPHIA, PA.
GREENSBORO, N. C. CHICAGO, ILL.